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28TH ANNUAL REPORT

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OF THE

MISSOURI

STATE BOARD OF AGRICULTURE

FOR THE

YEAR 1895.

JEFFERSON CITY, MO.:
TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS.
1896.

LETTER OF TRANSMITTAL.

OFFICE STATE BOARD OF AGRICULTURE,
COLUMBIA, MO., APRIL 1, 1896.

WM. J. STONE, Governer of Missouri:

I have the honor to transmit herewith a report of the work of the State Board of Agriculture for 1895, together with a review of crop conditions, statements from County Agricultural Societies, report of Farmers' Institute work and other papers in relation to the agricultural interest of Missouri.

The results of 1895, confirms our confidence in the possibilities of agriculture in this State and assure us that the highest success only awaits our earnest and intelligently directed efforts.

With hope that the work of this Board as herein reported may meet with your cordial approval, I am,

Most respectfully,

J. R. RIPPEY, Sec.

STATE BOARD OF AGRICULTURE.

EX OFFICIO MEMBERS.

WM. J. STONE, Governor.
JOHN R. KIRK, Superintendent Public Schools.
H. J. WATERS, Dean Agricultural College.

DISTRICT MEMBERS APPOINTED BY GOVERNOR.

District.	Name.	Postoffice.	Term Exp.
First	D. A. Ely.	Sublette	July, 1897
Second	John W. Hill	Chillicothe.	July, 1896
Third	Alex. Maitland	Richmond	July, 1896
Fourth	Eugene Rhoades	Fairfax	July, 1897
Fifth	J. F. Groves	Corder	July, 1896
Sixth	F. E. Bybee.	Harrisonville.	July, 1898
Seventh.	N. H. Gentry.	Sedalia	July, 1897
Eighth	L. F. Luthy	Lebanon	July, 1897
Ninth	J. A. Potts	Mexico	July, 1898
Tenth.	A. W. Meyer	Labaddie	July, 1898
Eleventh	Norman J. Colman	St. Louis	July, 1898
Twelfth.	Joseph Donovan	St. Louis	July, 1898
Thirteenth	W. R. Wilkinson	Altenberg	July, 1896
Fourteenth	P. N. Gully	Hutton Valley	July, 1896
Fifteenth.	C. P. Cook	Round Grove	July, 1897

OFFICERS.

Alex. Maitland	President	Richmond
D. A. Ely.	Vice-President	Sublette
J. R. Rippey	Secretary.	Columbia
S. B. Willis.	Assistant Secretary.	Mexico
H. H. Banks	Treasurer	Columbia
T. E. White	Veterinarian	Columbia
Maud Rippey	Stenographer	Glenwood
A. E. Hackett.	Meterologist	Columbia

EXECUTIVE COMMITTEE.

Alex. Maitland, D. A. Ely, J. F. Groves,
W. R. Wilkinson, H. J. Waters.

ANNUAL MEETING.

State Board of Agriculture met in annual session January 14, 1896, at office of Secretary, in Columbia, Mo. President Alex. Maitland called the meeting to order, and upon roll-call, the following members were present: D. A. Ely, John W. Hill, Alex. Maitland, Eugene Rhoades, J. F. Groves, F. E. Bybee, N. H. Gentry, L. F. Luthy, J. A. Potts, A. W. Meyer, Norman J. Colman, Joseph Donovan, W. R. Wilkinson, H. J. Waters and John R. Kirk.

During the year, Hon. H. C. Ireland, member from Second district, who has since died, tendered his resignation to the Governor, and John W. Hill of Chillicothe was named as his successor. Hon. Wallace Estill of the Seventh district, ex-President of the Board, also resigned, and was succeeded by N. H. Gentry of Sedalia.

Minutes of last meeting approved.

The Secretary submitted the following report of the work of the Board for 1895, together with a financial statement and such other suggestions as were deemed of importance to the agricultural interest of the State:

REPORT OF SECRETARY.

MR. PRESIDENT—Your Secretary has the honor to submit a brief review of the work of this Department and the agricultural conditions for 1895, together with a financial statement showing receipts and expenditure for the first year of this biennial period. Every effort has been made to conserve the funds, and strictest economy has been practiced at every point consistent with efficient service.

CROP REPORT.

CORN

Acreage was increased to 110 per cent as compared with 1894, and the estimated yield was 100 per cent of an average crop, or an increase per acre from 23 to 38 bushels. This gives a total acreage of 6,577,000 acres and a yield of 250,000,000 bushels of corn of superior quality, estimated at 103 per cent as compared with average quality.

WHEAT

Acreage sown in fall of 1894 was 1,550,000 acres, and the estimated yield per acre was 11 bushels, making a total of 17,000,000 bushels against 23,000,00 bushels in 1894. The crop suffered a damage estimated at 9 per cent in the shock by continued wet weather and overflow in valley lands.

The acreage sown in fall of 1895 as compared with 1894 shows a decrease of 18 per cent, or about 280,000 acres occassioned by a want of precipitation. The farmers in some localities being unable to prepare a seed bed.

OATS.

The acreage was increased to 1,140,000 acres, and the yield was estimated at 30 bushels per acre. The grain was good, heavy and bright. A damage of 9 per cent while in the shock was occasioned by continued rain.

HAY.

The acreage in meadows was decreased 10 per cent, leaving an acreage for 1895 of 2,360,000 acres and a total yield of 3,000,000 tons against 2,358,000 for last season.

PASTURES

Were reduced in area by contributing to the acreage planted to corn, but the State at large never yielded better and more nutritious pasturage than this season.

COTTON

Was only a fair crop, estimated at 80 per cent of an average and a yield of 253 pounds per acre. The area planted to cotton will approximate 48,000 acres and a total yield of 12,144,000 pounds, or 25,300 bales, of 480 each. The fiber of Missouri cotton is of superior quality, and her yield per acre this season compares favorably with that of any other State.

TOBACCO

Was estimated at 93 per cent of an average crop, covering an area of 10,000 acres and a yield of 750 pounds to the acre, or a total of 7,500,000 pounds. The quality is reported at 97 per cent of an average.

POTATOES

Were increased in acreage 3 per cent, and will approximate 96,000 acres. The condition was advanced from 65 per cent in 1894 to 101 in 1895, and indicates a yield of 10,000,000 bushels.

RECAPITULATION.

To place this in a more comprehensive form, we have produced in 1895, 250,000,000 bushels of corn, 17,000,000 bushels of wheat, 34,000,000 bushels of oats, 3,000,000 tons of hay, 12,000,000 pounds of cotton, 7,000,000 pounds of tobacco, 10,000,000 bushels of potatoes, an immense apple crop of only fair quality, and a good yield of small fruits, melons, flax, rye, castor-beans, broom-corn, clover and sorghum.

Our pastures have been nutritious, our live-stock in good condition and unusually healthy, with the exception of hog cholera by reason of which it is estimated we have lost 12 per cent of the swine in the State.

Statistics collected this season for 1894 show the following shipments of agricultural products from the State for the consumption of others: 600,000 head of cattle, 2,153,000 head of hogs, 72,000 horses and mules, 300,000 sheep, 10,000 cars of mixed live-stock, 14,186,000 bushels of wheat, 10,500,000 bushels of corn, 3,000,000 pounds of tobacco, 2,500,000 pounds of wool, 502,500,000 pounds of flour, 34,157,000 pounds of poultry, 18,688,000 dozen eggs, 2,358,000 pounds of butter, 357,000 pounds of cheese, 274,800 pounds of dairy products; total value estimated at $76,726,000.

STATE VETERINARY SERVICE.

This service as conducted for 1895 shows a large increase in the amount of work done and a material reduction in expenditures.

With the exception of hog cholera and swine plague, there has been an improvement in the general health of the live-stock of the State. Especial attention might be called to the decrease in number of cases of glanders and farcy, the disease being now practically under control, only 28 cases being reported for 1895 against 134 for 1894.

TEXAS FEVER.

There was an outbreak of Texas fever in St. Louis in the dairy herd of Joseph Winkleman, 205 May street, caused probably by driving southern cattle through this part of the city to local butcher yards on permits granted by an inspector of this Department.

The Board had long felt the danger of the transit of southern cattle through the city, but as there was no other way of supplying these shops with cheap cattle demanded by their respective markets, it seemed a necessity.

But the erection of a commodious abattoir near the stock-yards where cattle may be butchered with more economy and neatness than by the local butcher, the necessity for driving through the streets of St. Louis ceased to exist and the order was revoked.

There was also an outbreak of this disease in the month of July in the herd of C. C. McLemore of South Greenfield, Dade county, in which 13 head died.

Another outbreak occurred on the farm of J. R. Thomas of Mt. Leonard, Saline county, and 40 head died of the disease. This outbreak occurred in September.

QUARANTINE REGULATIONS.

The quarantine of the Federal Government against the counties of Newton and Jasper in this State, because of the existence of Texas fever infection in a certain locality in each county, necessitated the placing of an inspector at this point who might co-operate with Federal authorites and pass out, as natives, such cattle as were not infected or capable of spreading the infection.

D. F. Luckey was detailed for this work and applied himself with such zeal and earnestness as to give satisfaction to this Department and the cattle interests of these counties. Without this inspection and our State quarantine line, there was nothing to prevent the introduction of southern cattle in unltmited numbers into these counties, and the Federal Government having no anthority over the management of these cattle within the State, would have been powerless to prevent the driving or shipping of them to any part, thus exposing the entire cattle interest of the State to this infection.

Cattle in large numbers were driven from Arkansas across our southern boundry into Stone and adjacent counties. As our quarantine line is located several miles south of our State line with no means whatever of protecting it, it was impossible to say whether these cattle

had been brought across that line and into our State in violation of our regulations or not.

Until Arkansas shall formulate and enforce regulations that will protect her non-infected territory, it would be safe for our State and no injustice to her to make our quarantine line coincide with the southern boundary line of this State.

In addition to the inspection in Jasper and Newton counties, we have kept live-stock inspectors at St. Louis, Kansas City, St. Joseph and Hannibal, who were instructed to carefully guard these points, see that no cattle capable of spreading the infection were passed out into the State, and that regulations in relation to southern pens and cars were promptly enforced.

With every point of entry thus guarded against the introduction of Texas fever the cattle industry is in much safer condition than it had been heretofore with an inspector only at St. Louis.

ANTHRAX.

A severe outbreak of anthrax occurred among the live-stock of Jerry Deskin at Moberly, resulting in the loss of five cattle, twenty-two hogs and one mule. This stock was placed under strict quarantine, were all vaccinated with Pasteur's Anthrax vaccine and no more losses have been reported to this office.

HOG CHOLERA AND SWINE PLAGUE

Have raged with great virulence in the northwest part of the State. The State Veterinarian visited this section and personally inspected several herds.

As the able scientists who have been charged with the investigation of this disease are unable to offer any remedy that seems to be effective, nothing could be done other than advise sanitary regulations and such restrictions as would prevent the spread of the infection. This advice has been freely given to the public by the Veterinarian through the press and bulletins issued from this office.

The field-work or official calls have generally been answered by the State Veterinarian in person. Calls have been received from and 39 counties visited this season against 41 last year.

The people are becoming acquainted with the Veterinary laws of the State, note the manner in which it is designed to protect the great live-stock interest, and appreciate the work that is being done.

REPORT OF D. F. LUCKEY.

Secretary Board of Agriculture:

DEAR SIR—Concerning the cattle inspection in Jasper and Newton counties, I beg leave to report as follows:

Upon assuming duties here, I attempted to promote a general understanding of the object and practical working of quarantine regulations. Drovers were warned not to drive cattle from other infected territory into Missouri; butchers at Joplin, Webb City, Carterville, Carthage, Neosho and other towns were counselled not to purchase any cattle illegally brought into these counties, and cattle raisers and dealers were generally informed that by having their cattle inspected and securing permits they might freely drive or ship from Jasper and Newton counties to any other part of the State.

With the co-operation of farmers residing along the Kansas and Indian Territory line, the importation of infected cattle was prevented.

During the quarantine season shipment and "drive out" permits were issued for the movement of 2477 head of cattle. This number does not include those shipped by permits in co-operation with Government inspectors.

Early in the season infection was found to exist only in limited areas in the western parts of Jasper and Newton counties, but later it was found to have spread into the townships of Galena, Joplin, Marion and Duval, of Jasper county, and into the townships of Shoal Creek, Seneca, Dayton, Buffalo, Neosho and Marion, of Newton county. In the townships of Twin Grove, Mineral, Preston, Jackson, Sheridan, Madison, Union, Sarcoxie, McDonald and Lincoln, in Jasper county, and Van Buren, Newtonia, Granby, Benton and Franklin, in Newton county, no infection was found. If any exists, it is very limited.

As far as possible, the residents of Jasper and Newton counties have been informed of the benefit to be derived from carefully burning over all pastures and range, especially where infection exists. However, it can scarcely be expected that all the infection can be killed even in this way.

In view of the fact that Texas fever infection seems to be gradually crowding its way further northward, it would seem highly proper to rigidly enforce a just set of quarantine regulations for the general protection of the State of Missouri. By maintaining the present quarantine against all other infected territory, Jasper and Newton counties are protected, and there is formed a double line of protection to the State outside of these counties. Under the present system of inspection, cattlemen are not seriously hindered in the movement of their cattle, and have, therefore, no motive for driving infected cattle into non-infected counties.

It is evident that information gathered from Government inspectors, observation and otherwise that the Federal quarantine line crossing Northern Arkansas cannot be so well guarded as to prevent infected cattle from gaining access to the counties in said state north of the quarantine line. I believe, therefore, that the State of Missouri has just cause and should quarantine against the state of Arkansas, as a whole, admitting cattle from non-infected portions upon competent inspection. I further recommend that the infected counties of Missouri still be protected from all other infected territory, and that a suitable reward be offered by the State Board for the arrest and conviction of any person who may violate the State regulations.

Very respectfully submitted,

D. F. LUCKEY,
State Inspector.

Dr. F. W. O'Brien, live-stock inspector at Hannibal, in his report at close of quarantine season, says:

Since the quarantine has been established and enforced here a marked difference is noted in the mortality among dairy cows at this place and in the vicinity of the stock-yards at Oakwood.

Prior to this, from 40 to 50 cows died annually with this disease, and this season there has not been a single case—all, I think, due to the enforcement of the quarantine regulations.

STATE WEATHER SERVICE.

The work of this Department, especially that in connection with the distribution of weather forecasts and the publication and distribution of the weekly weather-crop bullentin, has been greatly extended during the year, and although there has been no increase in the office force, much more work has been accomplished, and the service has been made of much greater value to the agricultural interests of the State than during any previous year since its organization.

The number of voluntary meterological stations remains about the same as at the close of 1894. Several stations have been discontinued, owing to the resignation of the observers, but an equal number of new stations have been established. The equipment of the stations also remains practically the same, it having been impossible, with the present appropriation, to do more than replace such instruments as were accidently broken or otherwise rendered unserviceable. It is to be regretted that more funds were not available for the purchase of instruments, as many observers are using thermometers and rain-guages of the cheaper patterns which, in the interests of accuracy, should be replaced by standard instruments.

The monthly bulletin of the service has been issued regularly during the year, but it has been impossible to make any increase either in the amount of data published or the number of copies distributed.

The publication of the weekly weather-crop bulletin was begun April 9th, and the bulletin was issued regularly on Tuesday of each week until October 1st, when all crops being practically matured, it was discontinued for the season. As has been done heretofore, the bulletin was printed at this office and as it was impracticable to increase its size, a new font of minion type was purchased, expressly for this work, in order that more information might be given in the same space. On Monday afternoon of each week a brief summary of the weather and crop conditions throughout the State was prepared and printed on postal cards for distribution to the press, and in the regular issue of the bulletin this summary was followed by brief extracts from the

reports of the correspondents, arranged by counties. Three hundred and fifty copies of the advance summary for the press and 2300 copies of the complete bulletin were distributed each week, and through the co-operation of the postmasters the bulletin was posted for the benefit of the public in over 1400 postoffices. During October a special bulletin, reviewing the weather conditions of the crop season, was prepared and 1200 copies issued for distribution to voluntary observers, crop reporters and the press.

During the past year special attention has been given to the distribution of weather forecasts by mail, by what is known as the logotype system, and through the liberality of the National Weather Bureau and the co-operation of forecast displaymen and potmasters, a large number of distributing centers have deen established and the forecast bulletins are now posted daily in about 800 postoffices, or nearly all the offices in the State that can be reacheed in time to make the forecasts of value.

DEPARTMENT OF IMMIGRATION.

For the last two years an almost unlimited number of inquiries have been received at this office asking for information about the agricultural conditions of the State. These inquiries are generally from the North, Northwest and West, but numbers come from the Pacific slope, the South, the New England States, and not a few from Europe.

Every possible effort, with the funds avaliable, has been made to answer these inquiries. The annual report published in 1894 gave an estimate of the land in cultivation by counties, per cent of the remainder that could be profitably cultivated, the principal agricultural productions, principal live-stock, the general topography and the agricultural shipments made the previous year. Ten thousand copies of this report were published and the supply was exhausted in a few months after it was ready for distribution.

But still inquiries about our State were received by every mail, and in March last 1100 unanswered letters were on the Secretary's desk.

To answer these letters of inquiry and supply the demand until the 27th report could be issued, the Secretary compiled and printed with the April Crop Bulletin a synopsis of what "Missouri did at the World's Fair, the location, by counties, of the Government and Agricultural College land in the State and statistics of each county showing the taxable area, per cent of land in cultivation, principal agricultural pro-

ducts and live-stock, minerals developed, topography, population, assessed valuation, number of horses, mules, cattle, sheep and hogs, schools operated, teachers employed, pupils attending, amount expended for schools, permanent school fund, the annual precipitation and the annual mean temperature."

Other valuable information could have been given and answers made to many pertinent questions had we had but a little additional aid in compiling it.

It seems that the tide of immigration has been turned this way and is pouring into Missouri from every direction.

It is possible that this movement from the arid plains of the West and the ice bound regions of the North and the barren hills of the East, is yet in its infancy. Many of these men have capital seeking investment. Others want homes and bring with them energy and vigorous manhood that is a contribution to the material wealth of the State.

Every effort will be made by adjacent states to direct these people to other localities. They should not, as they have been in the past, be permitted to pass through Missouri without knowing something of her advantages and possibilities.

Statistics, covering the information sought by immigrants in addition to what is now collected in the office, could be gathered for a small sum and would certainly prove a profitable investment.

FARMERS' INSTITUTES.

Calls for these meeting were received from 106 points in the State, against 86 for 1894. A series of 40 meetings, well distributed over the State, was arraigned, being located at such points as made the most urgent calls and as we were accessable by rail.

The subjects discussed were "Clover as a stock food and as a fertilizer," "The science of live-stock breeding," The breeding and management of sheep," "The care and feeding of hogs," "The farm dairy," "Weeds, and how to get rid of them," "Commercial orchards," "Fruit for the farm," "How to grow strawberries," "Management of the vineyard," "The Agricultural College and its relation to the farmers," "The Experiment Station and its work," Industrial education," The State Veterinary Service," "Diseases of live-stock," "The care of poultry," "Bees and their relation to horticulture."

The attendance was larger than heretofore, and in many instances we could have held overflow meetings had we been supplied with a sufficient number of speakers.

The large attendance at the meetings, the deep interest manifested and resolutions asking for these meetings next season, evinces an increasing demand for this information and a determination upon the part of farmers to solve the problems of agriculture.

The attendance was composed of the active and progressive agriculturists of the vicinity. A very satisfactory feature was the large number of young men present. Upon these men we are to depend for the advanced agricultural conditions of the immediate future. Upon their energy and ability depend the development and progress of Missouri.

If they are properly trained and educated, if they apply themselves earnestly to the solutions of agricultural problems, if muscular strength and activity is intelligently directed, then every department of agriculture in this State is in its infancy, and our present condition is but the dawn of prosperty.

To meet the farmers of Missouri for a free interchange of opinions as to existing conditions, an open discussion of agricultural topics, to consider the best and most profitable way of handling our herds, growing our stock, conserving our soil, management of our orchards, and such other action as will continue Missouri in the front rank of the live-stock breeders and agricultural producers of the world, is the work of the Farmers' Institute.

What the Teachers' Institute is to education, what the Medical Association, Bankers' Association and Editorial conventions are to these interests, so is the Farmers' Institute to agriculture.

It is expected that these meetings will stimulate the farmer to fully investigate subjects connected with his vocation, will encourage him in earnest and intelligent application to the work he has in hand and by counseling with the institute workers, who are practical farmers, and with the progressive agriculturist of their locality obtain such information and arrive at such conclusions as will better his environments and contribute to his happiness.

Today in all departments of agriculture, Missouri leads the world, others follow. With an earnest and faithful application on the part of her farmers and live-stock breeders, with continued industry and the exercise of sound judgment and wise discretion and economy and business methods in every transaction, we may confidently expect to continue to lead in prosperity, wealth, advancement and intelligence.

Our unrivaled resources and our unlimited agricultural possibilities cannot be fully developed without the direction of intelligent and energetic husbandmen.

Ignorance, slothfulness and indolence will never develop our wonderful mineral resources, utilize our nutritious pastures, improve our herds, feed our flocks, cultivate our fields, advance horticulture or contribute to a high state of prosperity.

To aid in the desemination of valuable information, to stimulate intellectual activity, encourage investigation, to bring the farmers together for a conclusion as to their best interests, the Farmer's Institutes were organized and appropriations made for their support.

EDUCATIONAL.

That it is the duty of the State to educate it youths has never been questioned by the intelligent citizenship of this commonwealth. The expenditure for this purpose is a profitable investment, making returns in after years in a better government, a strong and intellectual people and the full development of your institutions.

With this as an evident and accepted fact, should not each indivual be taught what will best fit him for the work he will follow upon reaching maturity ?

The State has long since provided departments for teaching law, medicine and pedigogics, and the general government is supporting a department of agriculture. But when we remember that out of nearly ten thousand schools in this State attended by over three-fourths of a million of pupils, fully 90 per cent are located in the country and are attended exclusively by farmer's sons and daughters, a large majority of whom are unable to attend the Agricultural College, we are at once impressed with the fact that these children, upon whom will depend the duty of supplying this country with food products and furnishing the great bulk of our exports, are not being prepared and equipped for their calling as the great agricultural interests of the State would demand.

Agriculture may very properly be classed among the sciences, and farming as a profession. The intelligent mind will cultivate his field and manage his herd with increased profit. Information that cheapens the production of cereals, meats, vegetables and fruits will continue Missouri in the lead among the agricultural producers of the world, and contribute to her prosperty.

The manual labor of the farmer must be intelligently directed that success may be assured.

The State that leads in the dissemination of agricultural information will in the end outstrip other agricultural communities in wealth, progress and a full development of her resources.

The more general the distribution of this information the more valuable to the State. If the 760,000 pupils, most of whom are attending the country schools were taught the elements, the underlying principals of agriculture, the facts that have been ascertained by practical farmers and efficiently conducted experiment stations, we would in the near future send to our farms a class of young men full of energy and vitality and better equipped than were their fathers for the advancement of the great interests of the State.

The necessity for teaching this information in the country schools seems so apparent, the additional cost being practically nothing and the results of such immense value that it should not be deferred or neglected.

A detailed report of the work of the Board will be printed in the annual report. The object of this review is to give the design and scope of the work in a condensed form, that you may be the better enabled to suggest improvement, note defects or outline more efficient work. For what it may be worth to you and in the interest of argiculture, it is respectfully submitted.

FINANCIAL STATEMENT.

Date.	No. war	Name.	Dr.	Cr.
		State Veterinary Service.		
1895.				
Jan. 1....	.....	To balance	$1,139 40	
8....	431g	By Ballinger	.....	$22 16
8....	432g	Turner.....	.....	253 58
8....	433g	Rouif	.....	40 75
8....	434g	Meyer	.....	31 25
8....	435g	Adair.....	.....	24 69
8....	436g	O'Brien.....	.....	24 40
8....	437g	White	.....	9 50
8....	438g	Maud Rippey.....	.....	40 00
8....	439g	Carter & Co.....	.....	29 60
8....	440g	Ammerman.....	.....	79
Feb. 2....	441g	Turner	.....	294 38
2....	442g	Adair	.....	12 26
2....	443g	Rouif	.....	69 35
2....	444g	Maud Rippey	.....	40 00
Mch. 5....	445g	Turner	.....	270 83
5....	446g	White	.....	83 40
5....	447g	Maud Rippey.....	.....	40 00
5....	448g	Stephens.....	.....	5 00
5....	449g	Guitar	.....	2 50
April 5....	.....	To requisition	1,488 13	
5....	450g	By Turner.....	.....	286 38
5....	451g	Adair	.....	12 00
5....	452g	Rouif.....	.....	46 75
5....	453g	Meyer	.....	88 20
5....	456g	Maitland	.....	24 00
5....	457g	Ely	.....	15 60
5....	458g	Rhoades	.....	22 60
5....	459g	Connoway.....	.....	20 00
5...	460g	Carter & Co.....	.....	41 10
5....	461g	Maud Rippey.....	.....	40 00
5....	462g	Boughner	.....	50 00
5....	463g	Wilkinson	.....	25 00
5....	464g	Donovan.....	.....	10 50
5....	465g	Rouif	.....	25 90
5....	466g	Ammerman.....	.....	7 06
5....	467g	Meyer.....	.....	18 00
5....	468g	Turner.....	.....	240 84
May 1....	.....	To requisition.....	500 00	
1....	470g	By Maud Rippey.....	.....	40 00
1....	471g	Carter & Co.....	.....	8 75
1....	472g	Meyer.....	.....	35 00
1....	473g	Boughner.....	.....	25 00
1....	474g	Bruser.....	.....	25 00
1....	475g	Luckey	.....	66 65
June 5....	.....	To requsition.....	800 00	
5....	476g	By Turner.....	.....	270 75
5....	477g	White	.....	38 10
5....	478g	Meyer	.....	50 00
5....	479g	Rouif.....	.....	42 50
5....	480g	Luckey	.....	149 78
5....	481g	Bruser.....	.....	25 00
5....	482g	Boughner.....	.....	25 00
5....	483g	Maud Rippey	.....	40 00

FINANCIAL STATEMENT—Continued.

Date.	No. war.	Name.	Dr.	Cr.
1895.				
June 5....	484g	Child		$8 00
5....	485g	Guitar & N		2 50
July 3....		To requisition	$400 00	
3....	486g	By Turner		285 44
3....	487g	Luckey		109 20
3....	488g	Meyer		50 00
3....	489g	Boughner		25 00
3...	490g	Bruser		25 00
3....	491g	Maud Rippey		40 00
3....	492g	Carter & Co		8 50
3....	493g	Banks		23 65
Aug. 8. ..	....	To requisition	550 00	
8....	494g	By Geo. T. Coats		1 05
8....	495g	Chas Doxley		70
8....	496g	Eddie Smith		1 95
8....	497g	Turner		226 14
8....	498g	Rouif		75 75
8....	499g	Meyer		12 00
8....	500g	Meyer		50 00
8....	501g	Luckey		123 15
8....	502g	Roughner		25 00
8....	503g	Bruser		25 00
8....	504g	O'Brien		20 16
8....	505g	Maud Rippey		40 00
Sept. 4....	....	To requisition	600 00	
4....	507g	By White		33 80
4....	508g	Adair		7 00
4....	509g	Meyer		11 25
4....	510g	Meyer		50 00
4....	511g	Luckey		136 60
4...	512g	Boughner		25 00
4....	513g	O'Brien		25 00
4....	514g	Bruser		25 00
4....	515g	Maud Rippey		40 00
4....	517g	J. R. Rippey		6 25
4....	518g	Turner		258 65
4....	519g	Ammerman		50
Oct. 2....	....	To requisition	700 00	
2....	520g	By Turner		203 50
2....	521g	White		49 20
2....	522g	Rouif		7 50
2....	523g	Luckey		114 65
2....	524g	Meyer		50 00
2....	525g	Bruser		25 00
2....	526g	O'Brien		25 00
2....	527g	Boughner		25 00
2....	528g	Jesse Robards		7 00
2....	529g	Maud Ripney		40 00
2....	530g	W. E Harshe		1 00
2....	531g	Lyons Bros		50 00
2....	532g	Carter & Co		6 75
2....	533g	Stephens		26 60
2....	534g	Ammerman		2 89
Dec. 12....	....	To requisition	1,000 00	
12....	535g	By Turner		513 04
12....	536g	O'Brien		50 00
12....	537g	Bruser		50 00
12....	538g	Jesse Robards		9 50
12....	540g	Luckey		226 70
12....	541g	Stephens		22 00
12....	542g	Boughner		50 00
12....	543g	Meyer		100 00

FINANCIAL STATEMENT—Continued.

Date.	No. war.	Name.	Dr.	Cr.
1895.				
12 ...	544g	Maud Rippey	.....	$80 00
12....	545g	White	.....	70 65
12....	545g	White	.....	5 00
1896.				
Jan. 1....	.....	To balance	.....	459 41
			$7,177 53	7,177 53
		Monthly Crop Report.		
1895.				
Jan. 1....	.....	To balance	168 87	
8....	79c	By Billinger	.....	2 95
8....	80c	Stephens	.....	5 00
8....	81c	Rippey	.....	30 00
Mar. 5....	82c	Nellie Hale	.....	4 00
April 5 ...	83c	W. G. Barrett	.....	3 50
May 1....	.....	To requisition	250 00	
1....	84c	By E. W. Stephens	.....	200 00
1....	85c	R. J. Bouchelle	.....	26 26
June 5....	87c	E. W. Stephens	.....	32 00
July 3....	.....	To requisition	100 00	
3....	88c	By banks	.....	2 35
3....	89c	Stephens	.....	57 60
3....	90c	Bouchelle	.....	20 00
3....	91c	E. F. Ammerman	.....	6 35
Aug. 8....	.....	To requisition	25 00	
8....	92c	By Stephens	.....	52 10
8....	93c	W. A. Sails	.....	5 00
8....	94c	Bouchelle	.....	21 72
Sept. 4....	.....	To requisition	75 00	
4....	95c	By E. H. Carter & Co	.....	7 00
4....	96c	Bouchelle	.....	21 71
4....	97c	Stephens	.....	42 70
Oct. 2....	.....	To requsitton	50 00	
2....	98c	By Stephens	.....	25 30
2....	99c	Bouchelle	.....	15 92
Dec. 12....	.....	To requisition	50 00	
12....	100c	By Bouchelle	.....	22 30
13....	101c	Stephens	.....	20 20
1896.				
Jan. 1....	.....	balance in hands of our Treasurer	.....	94 91
			718 87	718 87
		Butterine Fund.		
1895.				
July 3....	.....	To requisition	200 00	
3 ...	1h	By Banks	.....	8 00
3 ...	2h	Rippey	.....	16 66
Aug. 8....	.....	To requisition	150 00	
8 ...	4h	By Rippey	.....	50 00
8 ...	6h	D. W. May	.....	98 35
8....	7h	Belcher Bros	.....	5 00
Sept. 4....	.....	To requisition	175 00	
4....	8h	By Rippey	.....	55 00
4....	9h	May	.....	62 35
4....	10h	Henry Heil Chemical Co	.....	11 40
4....	11h	Vivion Bros	.....	75
Oct. 2....	.....	To requisition	300 00	
2....	12h	By Stephens	.....	13 65
2 ...	13h	Bouchelle	.....	10 00
2....	14h	E F. Ammerman	.....	1 61
2...	15h	May	.....	86 05
2....	16h	Lewis Jehle	.....	87 80
2....	17h	J. R. Rippey	.....	50 00

FINANCIAL STATEMENT—Continued.

Date.	No. war	Name.	Dr.	Cr.
1895.				
Dec. 12....	.....	To requisition	$500 00	
12....	18h	By Henry Heil Chemical Co	.....	$12 04
12....	19h	Jehle	.....	60 00
12....	20h	E. W. Stephens	.....	3 60
12....	21h	Rippey	.....	100 00
12....	22h	Jehle	.....	16 65
12...	23h	"	.....	76 80
12....	24h	Mrs. McDougal	.....	16 00
12 ...	25h	Mrs. Wilkinson	.....	7 00
12....	26h	Henry Zimmerman	.....	23 00
12....	27h	May	.....	50 00
12....	27h	"	.....	75 10
12....	28h	"	.....	70 55
1896.				
Jan. 1....	.....	By balance in hands of our Treasurer	.....	253 64
			1,325 00	1,325 00
		Expense of Members Fund.		
1895.				
Jan. 1....	.....	To balance	243 46	
8....	136d	By Ballinger	.....	1 77
8....	137d	Stone	.....	8 10
8....	138d	Wolfe	.....	9 10
8....	139d	Groves	.....	20 10
8....	140d	Potts	.....	11 30
8....	141d	Maitland	.....	17 00
8....	142d	Luthy	.....	27 75
8 ...	143d	Ely	.....	23 00
8....	144d	Wilkinson	.....	21 30
8....	145d	Bybee	.....	24 50
8....	146d	Rhoades	.....	26 80
Feb. 2....	147d	Maitland	.....	11 00
2....	148d	Ely	.....	12 00
Apr. 5....	.....	To requisition	88 46	
5....	149d	By Stone	.....	8 50
5....	150d	Maitland	.....	13 00
5 ...	151d	Wilkinson	.....	22 00
5....	152d	Groves	.....	10 00
5....	153d	Ely	.....	11 00
May 2....	.....	To requisition	36 00	
2....	154d	By Ely	.....	11 00
Jun. 5....	155d	Potts	.....	15 80
5....	156d	Maitland	.....	12 00
July 3 ...	157d	Banks	.....	1 90
3....	158d	Potts	.....	3 90
3....	159d	Maitland	.....	13 00
3....	160d	Ely	.....	11 00
Aug. 8....	.....	To requisition	25 00	
8....	161d	By Maitland	.....	15 90
Sept. 4....	.....	To requisition	30 00	
4....	162d	By Maitland	.....	13 00
4....	163d	Ely	.....	11 00
Oct. 2....	.....	To requisition	25 00	
2....	164d	By Maitland	.....	12 00
Dec. 12....	.....	To requisition	300 00	
12....	165d	By Maitland	.....	14 00
12....	166d	Potts	.....	8 00
12....	167d	Ely	.....	15 00
12....	168d	Groves	.....	11 80
12....	169d	Wilkinson	.....	36 00
1896.				
Jan. 1....	.....	Balance	.....	264 40
			747 92	747 92

FINANCIAL STATEMENT—Continued.

Date.	No. war.	Name.	Dr.	Cr.
		State Weather Service.		
1895.				
Jan. 1....	.....	To balance	$167 58	
8....	113b	By Ballinger	.....	$1 48
8....	114b	Stephens	.....	25 00
Feb. 2....	115b	"	.....	25 00
Mar. 5....	116b	"	.....	25 00
April 5....	117b	"	.....	25 00
May 1....	.....	To requisition	100 00	
1....	118b	By Stephens	.....	43 40
1....	119b	O. C. McCardell	.....	8 00
June 5....	.....	To requisition	100 00	
5....	120b	By Schneider Bros	.....	76 00
5....	121b	McCardell	.....	8 00
5....	122b	Stephens	.....	25 00
July 3....	.....	To requisition	38 85	
3....	123b	By Banks	.....	1 55
3....	124b	Stephens	.....	31 65
3....	125b	McCardell	.....	8 00
3....	126b	E F. Ammerman	.....	3 35
Aug. 8....	127b	Stephens	.....	31 00
8....	128b	B F. Stewart & Sons	.....	1 00
8....	129b	McCardell	.....	8 00
8....	130b	Alex. T. Kirk	.....	3 00
Sept. 4....	.....	To requisition	30 00	
4....	131b	By Stephens	.....	31 00
4....	132b	McCardell	.....	8 00
Oct. 2....	.....	To requisition	50 00	
2....	133b	By McCardell	.....	8 00
2....	134b	Ammerman	.....	93
2....	135b	Stephens	.....	32 15
Dec. 12....	.....	To requisition	75 00	
12....	136b	By Joseph Jery	.....	1 00
12....	137b	Thomas Lewis	.....	50
12....	138b	L Frazer	.....	1 50
12....	139b	John Sullgree	.....	25
12....	140b	Stephens	.....	52 00
12....	141b	McCardell	.....	8 00
1896.				
Jan. 1....	.....	By balance in hands of treasurer	.....	68 67
			$561 43	$561 43
		Office Expense Fund		
1895.				
Jan. 1....	.....	To balance	120 56	
8....	105f	By Ballinger	.....	1 48
8....	106f	John Hobbs	.....	27 85
8....	107f	Carter & Co	.....	14 95
Feb. 1....	108f	Carter & Co	.....	3 00
1....	109f	Hobbs	.....	27 85
Mar. 5....	110f	Hobbs	.....	26 00
5....	111f	Ammerman	.....	3 90
April 5....	.....	To Requisition	71 92	
5....	112f	By Hobbs	.....	26 50
5....	113f	Carter & Co	.....	6 15
5....	114f	Ammerman	.....	4 80
May 1....	.....	To Requisition	50 00	
1....	115f	By Hobbs	.....	26 80
1....	116f	Carter & Co	.....	6 10
June 5....	.....	To Requisition	100 00	
5....	117f	By Hobbs	.....	26 50
5....	118f	Belcher Bros	.....	1 25
July 3....	119f	Banks	.....	1 55
3....	120f	Hobbs	.....	27 80

FINANCIAL STATEMENT—Continued.

Date.	No. war.	Name.	Dr.	Cr.
1895.				
July 3....	121f	Potts & Hord		$2 50
3..	122f	W. E. Harshe		2 00
Aug. 8....	123f	Hobbs		28 10
8....	124f	J. L. Maupin		50
8....	125f	Will Pomeroy		2 80
8....	126f	W. T. Maginnis		1 00
8....	127f	Columbia Gas Works		6 60
8...	128f	Vivion Bros		40
Sept. 4....	.....	To Requisition,	$40 00	
4....	129f	By Ammerman		8 71
4....	130f	Carter & Co.		16 45
4....	131f	John Hobbs		28 30
Oct. 2...	.....	To Requisition	50 00	
2....	132f	By Hobbs		27 05
2....	133f	Lyons Bros		3 35
2....	134f	Riley & Burkhart		1 30
Dec. 12....	.....	To Requisition	50 00	
12....	135f	By Hobbs		27 00
12....	136f	Barnard & Co		12 50
12....	137f	Hobbs		31 01
1896.				
Jan. 1....	.....	By balance in hands of our Treasurer		50 43
			482 48	482 48
		Distribution Annual Report Fund.		
1895.				
July 3....	54a	By H. H. Banks		1 55
Aug 8....	.....	To Requisition	150 00	
Sept. 4....	55a	By Carter & Co		7 00
1896.				
Jan 1....	.....	By balance in hands of our treasurer		141 45
			150 00	150 00
		Farmers' Institute Fund.		
1895.				
Jan. 1....	.....	To balance	2,251 38	
8....	314e	By Ballinger		11 83
8....	315e	Stephens		5 75
8....	316e	Ammerman		12 86
8....	317e	Postage		60 00
Feb. 1....	318e	Coleman's R. W		3 75
1....	319e	K. C. L. S. Ind		1 50
1....	320e	Harrington & Co		50
1....	321e	Maitland		9 45
1....	322e	Journal of Agr		2 25
1....	323e	Stephens		112 50
1....	324e	Rippey		24 15
1....	325e	Tribune Printing Co		16 70
Mch. 5....	326e	Rippey		29 15
5....	327e	Penn Brace		1 75
5....	328e	Guitar		5 00
April 5....	330e	Vieth & Miller		34 00
5...	331e	Rippey		10 85
May 2....	332e	Ammerman		2 39
June 5 ..	333e	Rippey		13 25
5....	335e	Bouchelle		30 50
5....	336e	Barnard & Co		28 00
5....	337e	Stephens		8 90
July 3....	338e	Banks		9 45
3....	339e	Bouchelle		20 00
Aug. 8....	340e	Charley Edwards		1 95
8....	341e	Will Pomeroy		1 95

FINANCIAL STATEMENT—Continued.

Date.	No. war.	Name.	Dr.	Cr.
1895.				
8....	343e	Guitar & N.....	.....	$1 50
8....	344e	Bouchelle.....	.....	20 00
Sept. 4....	345e	Bouchelle.....	.....	10 50
Oct. 2....	.....	To requisition	$2,000 00	
2....	346e	By Bouchelle.....	.....	32 00
2 ...	347e	Will G. Barrett	.....	17 50
2....	348e	Lyons Bros.....	.....	20 00
2....	349e	Ammerman.....	.....	1 84
2....	350e	Rippey.....	.....	1,684 66
2....	351e	Rippey.....	.....	1,600 00
Dec. 12....	352	W. G. Barrett	.....	8 50
12....	353e	Bouchelle	.....	36 45
12....	354	Barnard & Co	.....	12 95
1896.				
Jan. 1....	.....	By balance in hands of our Treasurer....	.....	342 10
			4,251 38	4,251 38

Secretary's Account With Institute Fund.

Date.	Name.	Dr.	Cr.
1895.			
Jan. 1....	By overdraft on December, postal account	.....	3 95
Oct. 2....	To warrant on Institute fund.....	1,684 66	
2....	Warrant on Institute fund	1,600 00	
Dec 12....	By receipt from T. B. Terry	.....	428 23
12....	R. M. Bell.....	.....	380 59
12....	N. F. Murray.....	.....	452 37
12....	G. W. Waters.....	.....	383 50
12....	John Patterson.....	.....	326 30
12....	E. T. Abbott.....	.....	20 00
12....	J. R. Rippey.....	.....	226 76
12....	H. J. Waters	.....	136 81
12...	Poultry Association	.....	50 00
12....	Van Trump.....	.....	5 00
12....	Holt Co. Sentinel	.....	5 00
1896.			
Jan. 1....	To balance.....	.....	866 15
		3,284 66	3,284 66

SUMMARY OF FINANCIAL STATEMENT.

Date.	Name.	Dr.	Cr.
	State Veterinary Service.		
1895.			
March	To appropriation	$15,000 00	
Dec.31....	By balance with State Treasurer		$8,961 87
31....	balance with our Treasurer		459 41
31....	amount of appropriation expended		5,578 72
		15,000 00	15,000 00
	Monthly Crop Reports.		
1895.			
March	To appropriation	1,500 00	
Dec.31....	By balance with State Treasurer		950 00
31....	balance with our Treasurer		94 91
31....	amount of appropriation expended		455 09
		1,500 00	1,500 00
	Butterine Fund.		
1895.			
March	To appropriation	5,000 00	
Dec.31....	By balance with State Treasurer		3,675 00
31....	balance with our Treasurer		253 64
31....	amount of appropriation expended		1,071 36
		5,000 00	5,000 00
	Expense of Members' Fund.		
1895.			
March	To appropriation	1,200 00	
Dec.31....	By balance with State Treasurer		695 54
31....	balance with our Treasurer		264 40
31....	amount of appropriation expended		240 06
		1,200 00	1,200 00
	State Weather Service.		
1895.			
March	To appropriation	1,000 00	
Dec.31....	By balance with State Treasurer		606 15
31....	balance with our Treasurer		68 67
31....	amount of appropriation expended		325 18
		1,000 00	1,000 00
	Office Expense.		
1895.			
March	To appropriation	1,000 00	
Dec.31....	By balance with State Treasurer		638 08
31....	balance with our Treasurer		50 43
31....	amount of appropriation expended		311 49
		1,000 00	1,000 00
	Distribution Annual Report.		
1895.			
March	To appropriation	1,000 00	
Dec.31....	By balance with State Treasurer		850 00
31....	balance with our Treasurer		141 45
31....	amount of appropriation expended		8 55
		1,000 00	1,000 00
	Farmers' Institutes.		
1895.			
March	To appropriation	6,000 00	
Dec.31....	By balance with State Treasurer		4,000 00
31....	balance with our Treasurer		342 10
31....	amount of appropriation expended		1,657 90
		6,000 00	6,000 00

REPORT OF H. H. BANKS, TREASURER,

TO THE BOARD OF AGRICULTURE OF MISSOURI, JAN. 14, 1896.

Farmers' Institute Fund

1895.					
Jan. 8..	To balance.....	$2,251 58	By warrants canceled and returned....	$3,909 28
Oct. 14..	State warrant..	2,000 00	balance on hand	342 30
		4,251 58		4,251 58

Distributing Annual Report

1895.				
Sept. 9..	To State warrant..	$150 00	By vouchers paid and returned.....	$8 55
			balance	141 45
		150 00		150 00

Office Expense.

1895.				
Jan. 8..	To balance	$120 56	By vouchers paid and returned.....	$432 05
April 12..	State warrant..	71 92	balance.	50 43
May 6..	" " ..	50 00		
June 12..	" " ..	100 00		
Sept. 9..	" " ..	40 00		
Oct. 10..	" " ..	50 00		
Dec. 18..	" " ..	50 00		
		482 48		482 48

State Weather Service

1895.				
Jan. 8..	To balance	$167 61	By vouchers paid and returned.....	$492 76
May 9..	State warrant..	100 00	balance	68 70
June 12..	" " ..	100 00		
July 6..	" " ..	38 85		
Sept. 9..	" " ..	30 00		
Oct. 10..	" " ..	50 00		
Dec. 18..	" " ..	75 00		
		561 46		561 46

Expense of Members.

1895.				
Jan. 8..	To balance.....	$243 46	By vouchers paid and returned.....	$483 52
April 12..	State warrant..	88 46	balance	264 40
May 6..	" " ..	36 00		
Aug. 17..	" " ..	25 00		
Sept. 9..	" " ..	30 00		
Oct. 10..	" " ..	25 00		
Dec. 18..	" " ..	300 00		
		747 92		747 92

Monthly Crop Report.

1895.				
Jan. 8..	To balance.....	$168 87	By vouchers paid and returned...	$623 96
Feb. 23..	State warrants..	250 00	balance.....	94 91
July 6..	" " ..	100 00		
Aug. 17..	" " ..	25 00		
Sept. 9..	" " ..	75 00		
Oct. 10..	" " ..	50 00		
Dec. 18..	" " ..	50 00		
		718 87		718 87

Veterinary Fund.

1895.				
Jan. 8..	To balance.....	$1,139 40	By vouchers paid and returned.....	$6,718 12
April 12..	State warrant..	1,488 13	balance.....	459 41
May 6..	" " ..	500 00		
June 12..	" " ..	800 00		
July 6..	" " ..	400 00		
Aug. 17..	" " ..	550 00		
Sept. 7..	" " ..	600 00		
Oct. 10..	" " ..	700 00		
Dec 18..	" " ..	1,000 00		
		$7,177 53		$7,177 53

Butterine Fund.

1895.				
July 6..	To State warrants..	$200 00	By vouchers paid and returned.....	$1,071 36
Aug. 17..	" " ..	150 00	balance.....	253 68
Sept. 9..	" " ..	175 00		
Oct. 10..	" " ..	300 00		
Dec. 28..	" " ..	500 00		
		1,325 00		1,325 00

All of which is respectfully submitted.

H. H. BANKS, Treasurer.

January 14, 1896.

ELECTION OF OFFICERS.

The Board then entered into the election of officers for the ensuing year and the selection of a State Veterinarian, who, under the statutes, will serve for the next four years, and the results were as follows:

For President, Alex. Maitland.
For Vice-President, D. A Ely.
For Secretary, J. R. Rippey.
For Assistant Secretary, S. B. Willis.
For Treasurer, H. H. Banks.
For State Veterinarian, T. E. White.

EXECUTIVE COMMITTEE.

Alex. Maitland, D. A. Ely, W. R. Wilkinson, J. F. Groves and H J. Waters.

REPORT OF THE COMMITTEE OF THE MISSOURI STATE BOARD OF AGRICULTURE.

Authorized by Law to Examine into the Condition and Work of the Agricultural College and Experiment Station, for the Year 1895.

We, your committee, to whom was assigned the duty of examining into the affairs of the Agricultural College and Experiment Station as provided by law, beg leave to submit the following report:

A careful examination was made of all experiments being conducted in the interest of Agriculture and Horticulture. The condition of the farm, the horticultural gardens and the live-stock was carefully noted. We met all the professors in charge of the departments of the college who explained to us in detail the work they were doing.

Prof. H. J. Waters, Dean of the College and Director of the Station, was accessible at all times, was familiar with all the details in connection with these departments, has the management well in hand and clearly reviewed the work in progress as well as the plans for improvement in the future.

The Agricultural Farm is in good condition and the experiments being conducted are carefully cared for and the management appears to be capable and efficient.

The live-stock show good care and proper attention. The grades and crossbred animals have been disposed of and those now on the farm are thoroughbreds and fair specimens of their kind.

We are impressed with the necessity of continued development of these herds and would recommend the mating with only the best males, and such care and attention as may be necessary in achieving the highest results. It should be remembered that improvement in breeds of live-stock is continually going on. The prize winner of today will be the scrub of the near future. The production of the progeny of pure bred sires and dams is not the science of live-stock breeding. Only the careful breeder, who judiciously mates the very best animals with a purpose, notes the results and earnestly applies himself to the word in hand, can succeed. We are anxious to see the Station take high rank among this class of breeders, and are encouraged to believe that success awaits their efforts.

The herd of dairy cows is composed of thoroughbred Jerseys, are good animals, and with judicious handling promise to become noted in the production of butter-fat.

This herd is now being kept at a profit, a good quality of butter is made, and the herd in connection with dairy instruction is a necessity.

We believe herds of thoroughbred hogs, for experimental purposes, might be advantageously kept. The farm is well provided with suitable pens and lots for their care and management, and the points of value in the different breeds could perhaps be noted here with more accuracy and given to the public more readily than from elsewhere or from under other conditions.

The Horticultural grounds are in good condition and many experiments that will no doubt prove profitable are being conducted. Others of material value to Missouri horticulture will be made at an early date.

It is advisable that the Professor of Horticulture should reside on the grounds in the midst of his work, fruits and experiments. The old residence, never suitable, and now in a dilapidated condition, should be demolished and a comfortable, modern cottage erected in its stead.

Ample lecture-rooms for the horticulturist should be provided on the grounds where the student may be brought in contact with the actual work and become versed in practical as well as scientific horticulture.

We note with satisfaction the care that is now being given the Agricultural Museum. Many of the samples have suffered so severely from neglect as to be entirely worthless and should be removed and new samples substituted. The most valuable specimens of all of Missouri agricultural products should be added without delay.

Skeletons and stuffed specimens of noted live-stock, that in many instances could be procured at a nominal cost, would add interest and value to the museum.

The manner of indexing the bulletins of Experiment Stations and other agricultural publications, making the information readily accessible to the students and others who seek it, meets with our hearty approval.

RECOMMENDATIONS.

Appropritions by the Legislature.—The large agricultural and horticultural interests of Missouri demand of the College of Agriculture and the Experiment Station the best work possible. These institutions should take the rank among similar institutions of the country that our agriculture and horticulture take among the states of the Union. We believe that everything possible is being done with the funds and equipment at command, yet your committee believes that the work now being done does not begin to meet the reasonable demands of our people for the solution of important questions relating to soil renovation, the maintenance of fertility, crop-growth, stock-breeding, stock-feeding, dairying, variety of fruits, the best methods for their propagation and culture, the best means of combatting insect pests and fungus diseases and the education of the coming farmer and fruit-grower in those branches of learning which will best insure his success.

To place these institutions in position to fully meet these demands, several new buildings should be erected and considerable material should be added to the equipments of all the departments, as follows:

Department of Agriculture.—A suitable dairy building with class-rooms should be erected on the farm and completely equipped with the machinery and appliances necessary for the best instruction in private dairying and creamery management.

The erection of better sheep sheds and two silos.

The repainting of barns and other buildings on the farm.

The purchase of museum specimens for better instruction in animal husbandry.

Department of Horticulture.—For the erection of a suitable cold-storage plant in which experimental fruits may be kept, containing rooms for grafting by students.

A tool shed and repair of buildings.

A suitable cottage house for the horticulturist.

The improvement of the Horticultural grounds, laying out and making roads, planting out shrubbery and experimental orchards.

Department of Entomology.—The erection of and equipment of a suitable entomological laboratory.

The Entomologist is very much crowded and his present quarters are entirely inadequate and unsuited to his work. A building specially designed for the work is imperative. The rapid multiplication of injurious insects, both in kinds and in numbers, renders the work of this department of great importance, and every facility should be given it for the best work.

Chemical Department.—The better equipment of the chemical laboratory of the experiment station.

Additions to the Agricultural library.

These recommendations for appropriations for improvements, have been made with the greatest regard for economy, and are believed to call for the least possible expenditure that would give these departments the efficiency the State of Missouri has a right to demand and really deserves.

Department of Domestic Economy.—Missouri is more deeply interested in the production of a race of farmers mentally, morally and physically strong, refined and cultured, with a deep, abiding love for their homes and their calling—the peer of any class in any country in the world—than in the production of the finest and most perfectly developed herds and the most bountiful harvests.

We therefore most earnestly recommend that the Curators of the University provide as speedily as possible for a department of domestic economy in the College of Agriculture, organized on the broadest plan so as to include the science of cooking, the chemistry of foods and their relation to the health and development of the human body, the art and science of home decoration, etc. In short, to cover the entire range of home building and of home management.

We are impressed with the earnestness of the Agricultural College Faculty and those in charge of the Experiment Station, and have no reason to doubt their capability or efficiency. In fact, we believe this Faculty, in point of intellegence, thorough qualification and earnest application to their duties, will rank with that of any other department of the State University.

Thus equipped, and with a disposition on the part of the Board of Curators to give the College and Experiment Station every possible advantage, there is no reason why this department should not rapidly develop in strength and usefulness and fully serve the purposes for which it was intended.

The Board of Curators submit through their executive committee the following proposition looking to the use of your board as advisory council, when considering matters in relation to Agricultural College and Experiment Station :

"1. When at the close of a biennial period plans are adopted for a division in the next biennial period of funds between : 1st, the University and the College; and 2nd, between the College and the Station, the plans for division should be submitted to the State Board of Agriculture and their judgment should be asked about the fairness and propriety of the proposed plans. If they file any objection, this, of course, should be received with most careful consideration from the Curators.

"2. A plan should be made by the station staff, including the president of the University, for experiments in agriculture, horticulture, stock-breeding, dairying, etc., and submitted first to the Board of Curators and after revision by them to the Board of Agriculture for suggestions. If objections are raised by the State Board of Agriculture or suggestions are made, these should receive the most careful consideration and the plan should be finally revised, adopted and carried out by the Curators.

"3. In addition to these two stated matters of consultation, the Board of Curators should from time to time submit to the State Board of Agriculture such things as seem to be of sufficient importance."

While we feel that this Board has no reason to seek additional responsibilities, we would advise that your counsel should not be withheld where it can be used in the interest of progressive agriculture, nor should you decline to make answer to any important matters that may be submitted. We, therefore, approve of the above proposition.

Through the courtesy of the Proctor of the University and the Secretary of the Experiment Station, we file herewith a statement of the receipts and expenditures of these institutions.

All of which is respectfully submitted.

(Signed) D. A. ELY,
W. R. WILKINSON,
J. F. Groves.

AGRICULTURAL COLLEGE.

Statement of Income and Expenditures on account of Morrill Fund for the eleven months ending November 30, 1895.

1895.			
Jan. 8....	To balance on hand.....	$1,404 09	
Oct. 2....	Seventh annual installment.....	19,858 34	
			$21,262 43
	Credits as follows:		
	By School of Mines.....	4,964 58	
	C. W. Marx.....	1,833 34	
	A. H. Place	916 66	
	H. VanBlarcom	875 00	
	J. N. Baskett	30 00	
	E. T. Abbott.....	41 75	
	J. L. Erwin	10 50	
	G. A. Wauchope.....	800 00	
	H. C. Penn.....	1,175 00	
	H. M. Belden	300 00	
	L. M. Defoe	625 00	
	E. B Cauthorn.....	333 34	
	Howard Ayers.....	543 00	
	Silas Dinsmoor	416 66	
	J. C. Whitten.....	416 66	
	Paul Schweitzer	275 00	
	Irving Hordesty.....	150 00	
	M. S. King.....	666 66	
	A. J. McCulloch.....	180 00	
	H. K. White.....	140 00	
	M. Estelle Porter.....	200 00	
	Equipment of shop.....	2,500 00	
	Supplies for shop.....	82 10	
	Balance on hand.....	3,787 18	
			21,262 43

Statement of Income and Expenditures on account of A. and M. College Fund for the eleven months ending November 30, 1895.

1895.			
Jan. 1....	To interest on endowment	$7,925 00	
	Warrants of 1894 paid by University	437 50	
July 1....	Interest on endowment	8,457 53	
Sept.	Tuition fees	370 00	
Oct.	"	30 00	
Nov.	"	10 00	
			$17,230 03
	Credits as follows:		
Jan. 1....	By overdraft	5,815 47	
12....	School of Mines	1,981 25	
July 31....	"	2,114 38	
	C V. Riley	600 00	
	Misses Porter	41 67	
	G. C. Rroadhead	1,583 34	
	W. J. Quick	1,333 34	
	Howard Ayers	1,000 00	
	L. M. Defoe	750 00	
	Silas Dinsmoor	500 00	
	J. C. Whitten	500 00	
	Paul Schweitzer	393 00	
	E. B. Cauthorn	400 00	
	F. B. Mumford	500 00	
	C. F. Marbut	250 00	
	H. J. Waters	125 00	
	J. G. Babb	166 67	
	John W. Connoway	125 00	
	R. E. Graham	100 00	
	J. W. Monser	83 33	
	Current expenses	3,929 28	
	Equipment	307 27	
	Overdraft	.....	5,368 97
		22,599 00	22,599 00

A. and M. College Equipment Fund.

1895.			
Jan. 1....	To appropriation	.....	$8,800
	Credits as follows:		
Mch. 31...	By equipment of shop	$2,500 00	
Oct. 31...	Columbia Planing Mill Co., 1 protection case, Stedman	19 30	
31...	F. P. Miller, changes in Agricultural building (paid by University)	700 00	
31...	M. F. Bell, commissions on plans and specifications (paid by University)	80 00	
Nov. 30...	Whitall, Latum & Co., apparatus for Entomology	21 24	
	Baush & Lomb Optical Co., apparatus for Entomology	266 73	
	F. P Miller, contract for greenhouse, etc., (unpaid)	3,000 00	
	Matthews & Walker et al., heating greenhouse (unpaid)	655 00	
	Balance	1,557 73	
			$8,800

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

LIVE-STOCK.		
Registry fees, voucher 392	$7 00	
		$7 00
TRAVELING EXPENSES.		
E. D. Porter, vouchers 256,287	31 75	
		31 75
CONTINGENT EXPENSES.		
E. W. Stephens, voucher 393	60	
W. G. Barrett, voucher 397	75	
Miss Lizzie Schweitzer, voucher 411	1 75	
American Association Agricultural Colleges and Experiment Stations, voucher 440	10 00	
I. Switzler, Sec'y, voucher 523	50	
		13 60
BUILDING AND REPAIRS.		
Joseph Gerig, voucher 232	4 75	
W. B. Creasy, voucher 234	4 50	
C. C. Newman & Co., voucher 520	1 25	
		10 50
		5,686 02
Agricultural Department.		
LABOR.		
C. M. Conner, assistant in agriculture	700 00	
C. M. Conner, for student labor, voucher 559	10 00	
P. C Lillard	420 25	
A. M. Soule	80 00	
W. C. Vandiver	280 00	
Robert Willis	385 25	
William O'Bryan	80 50	
J. M. Pyne	74 25	
William L. Powell	33 30	
Charles Madison	150 50	
L. D Benedict	67 00	
Miss M E Porter, stenographer	36 00	
Charles Dexley	6 10	
Willis B. Schweitzer, chinch-bug laboratory	113 30	
Geo. R. Jacobs, Jr., "	21 50	
F. F Thompson, "	4 95	
Overton McConathy, "	2 50	
Henry Washington	133 80	
Mat Marshall	177 65	
Lon Buckner	34 85	
Alfred Kelly	20 00	
Harrison Clayborne	19 25	
Joe Wright	12 40	
Milton Kelly	16 75	
Horace Williams	46 40	
Edward Harrington	12 05	
Alonzo Lillard	38 35	
Charles Cowden	7 00	
Howard Fewsmith (Davis)	7 35	
David May	1 00	
Thomas F. McQuitty	8 82	
Wm. A. Luckens	6 00	
H. C. Hurd	1 00	
Osborne Cook	8 00	
Will Wilson	11 50	
Pomp Turner	1 00	
Jordan Redman	1 00	
Cliff VanHorn	2 00	

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

James Freeman	$2 00	
George Maxwell	10 50	
J. Buckmaster	8 00	
J. Woody	1 50	
Walter Wilson	6 50	
Eugene Williams	8 00	
George Davis	4 50	
Oscar Marshall	24 00	
Thomas Griffin	3 75	
Harvey McBaine	3 75	
David Rice	5 75	
Harry Barrows	12 50	
James Harris	2 00	
Squire Roley	3 75	
W. J. Burney	50	
Ed. Powers	1 75	
John Flood	2 50	
C. H. Jenkins	3 00	
Will Clark	3 75	
Green Martin	3 75	
		$3,143 32
POSTAGE, STATIONERY AND PRINTING.*		
R. J. Bouchelle, vouchers 468.528,555	61 52	
W. G. Barrett, vouchers 469, 556	49 25	
E. W. Stephens, voucher 558	22 50	
		133 27
FREIGHT, EXPRESS AND DRAYAGE.		
Plant Seed Co., vouchers 273, 511	10 90	
E. D. Porter, voucher 290	1 90	
I. Switzler, secretary, vouchers 477,513	24 22	
Fairbanks, Morse & Co., voucher 292	25	
DeLaval Separator Co., voucher 429	1 05	
P. Schweitzer, voucher 431	78 08	
		116 40
CHEMICAL SUPPLIES.		
F. W. Peck & Co., voucher 531	2 00	
		2 00
SEEDS, PLANTS AND SUNDRY SUPPLIES.		
Plant Seed Co., vouchers 229,273,511	52 12	
Dibble Seed Co., voucher 510	62 50	
J. L. Kechley, voucher 527	10 00	
J. W. Rouse & Co, voucher 230	8 50	
C. H Dana, voucher 228	7 35	
A. I. Root, voucher 190	22 80	
Wm A. Gill & Co., voucher 557	25 20	
G. L. Norvell, voucher 297	3 25	
I. Switzler, secretary, voucher 523	1 75	
E. F. Henderson, voucher 346	4 60	
C. M. Conner, voucher 379	1 85	
F. W. Peck & Co., voucher 389	6 25	
Gilman & Dorsey, voucher 390	11 45	
Strawn & Boswell, voucher 434	75	
Chas. Doxley, voucher 508	1 00	
C. C. Newman & Co., voucher 520	2 15	
Gas Company, voucher 219	3 15	
Loeb & Son, vouchers 222,275,383,433,467	31 99	
McAlester Lumber Co., vouchers 226,506,562	6 05	
Chas. Matthews, vouchers 223,265,304,334,380,473,561	70 30	
W. W. Hornberger, voucher 240	4 50	
Scott & Hubbell, vouchers 291,387	8 00	

*The major part of this expense was for the distribution of diseased chinch-bugs, etc.

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

W. B. Nowell, voucher 299	$5 75	
Robert Maddex, voucher 302	15 00	
J. J. Pauley, vouchers 332,475,529,563	17 45	
Bell & Naylor, voucher 333	3 65	
R. U. Coombe, voucher 335	2 75	
Branham, Mitchell & Robinson, voucher 337	4 38	
R. B. Gordon, vouchers 338,473	6 15	
		$400 64
FERTILIZERS.		
Whitelaw Bros., voucher 274	9 73	
Mayer Mfg. Co., voucher 474	69 00	
C. M. Conner, voucher 379	9 70	
J. H. Guitar, voucher 471	12 20	
		100 63
FEEDING STUFFS.		
Boone Co. Milling Co., vouchers 186,222,267,296,336,377, 432,478,512.530,560	777 30	
Farmers' Milling Co., voucher 269	10 05	
Loeb & Son, vouchers 275,339	11 10	
		798 45
TOOLS, IMPLEMENTS AND MACHINERY.		
McAlester Lumber Co., vouchers 183,270,506	19 78	
C. C. Newman & Co., vouchers 184,293	8 50	
Fred Bihr, voucher 192	4 50	
Chas. Matthews, vouchers 265, 380	13 35	
E. D Porter, voucher 290	7 00	
Beverly Chapman, voucher 476	90	
Creamery Mfg. Co., voucher 193	31 51	
Fairbanks, Morse & Co., voucher 292	3 53	
DeLaval Separator Co., voucher 429	5 85	
		94 92
LIVE-STOCK.		
Registry fees, voucher 477	6 00	
		6 00
TRAVELING EXPENSES.		
Fairbanks, Morse & Co., voucher 292	7 40	
J. H. Guitar, voucher 471	10 50	
		17 90
CONTINGENT EXPENSES.		
Fairbanks, Morse & Co., voucher 292	11	
DeLaval Separator Co., voucher 272	1 61	
Wm. A. Gill & Co., voucher 194	25 20	
L. G. Norvell, vouchers 221,268,378	12 20	
Chas. Matthews, voucher 182	20 90	
Allen Park, voucher 381	76 66	
R. U. Coombe, vouchers 185,220	7 50	
F. B. Tumy, voucher 188	1 00	
Stanley Smith, voucher 382	2 00	
Branham, Mitchell & Robinson, voucher 189	1 35	
Fred Bihr, vouchers 192,388	16 30	
Bell & Naylor, voucher 218	4 50	
McAlester Lumber Co., voucher 226	15 20	
J. J. Pauley, vouchers 266,384	7 95	
Matthews & Walker, voucher 385	8 75	
T. W. Conley, voucher 386	2 60	
F. W. Peck & Co., voucher 389	2 75	
Gilman & Dorsey, voucher 390	1 75	
W. W. Hornberger, voucher 430	1 25	
Hickam & Estes, voucher 507	4 55	
		214 13

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

BUILDING AND REPAIRS.		
McAlester Lumber Co., vouchers 183,226,270,303	$75 45	
Hickam & Estes, vouchers 187,294	2 30	
Joseph Gerig, voucher 191	10 00	
John Crist, vouchers 224,271,301	60 00	
Matthews & Walker, vouchers 227,295	22 65	
C. C. Newman & Co., voucher 293	11 00	
W. W. Hornberger, voucher 300	9 95	
		$191 35
		5,219 01
Horticultural Department.		
SALARIES.		
C. A. Keffer to Oct. 1, 1894	375 00	
J. C. Whitten from Oct. 1, 1894	624 90	
		999 90
LABOR.		
John Hack	113 70	
N. O. Booth	288 22	
Squire Roley	395 03	
James Byers	69 05	
James Harris	160 75	
J. M. Pyne	65 00	
T. I. Mairs	10 03	
O. L. Cook	13 00	
S. B. Jenkins	13 00	
C. O. Jenkins	4 95	
C. M. Jackson	7 00	
C. L. Baender	5 90	
L. Hegnaur	40	
E. Connell	2 20	
J. W. Gibson	1 75	
D. W. May	2 60	
Miss Bonnie Keffer	3 00	
D. F. Hart	5 23	
P. V. Dimmitt	68	
J. M. Fisher	2 25	
J. Shouse	6 60	
Frank Balthis	4 70	
Wm. F. Switzler, Jr	5 25	
Walter Llewellyn	5 15	
A. J. Sears	1 50	
M. E. Williams	4 40	
L. J. Wilson	1 00	
O. N. Sevier	2 75	
C. M. Davidson	50	
J. E. Weatherby	6 50	
James Lipscomb	2 00	
Millard Lipscomb	2 95	
Howard Davis	3 20	
J. Price	40	
J. W. Skelly	1 80	
B. Munday	90	
W. T. Conley	1 00	
H. Cook	75	
Thos. Vandiver	1 25	
Robert R. Allen	4 25	
Fred Dearing	1 60	
		1,222 19

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

POSTAGE AND STATIONERY.		
E. W. Stephens, voucher 417	$2 00	
W. E. Harshe, vouchers 418,457	3 45	
R. J. Bouchelle, voucher 448	2 50	
W. G. Barrett, voucher 454	2 25	
Field Pump Co., vouchers 500,571	22	
		$10 42
FREIGHT, EXPRESS AND DRAYAGE.		
C. A. Keffer, vouchers 173,206	8 84	
J. C. Whitten, vouchers 494,542	4 49	
Plant Seed Co., voucher 284	40	
Michel Seed Co., voucher 367	1 25	
New Haven Nursery Co., vouchers 412,497	85	
Thorburn & Co., voucher 414	1 35	
Peter Henderson, voucher 458	1 35	
Heil Chemical Co., vouchers 460,501,566	2 35	
Storrs & Harrison, voucher 499	60	
Bradley Whidden, voucher 574	2 50	
		23 98
HEAT, LIGHT AND WATER.		
Water & light Co., vouchers 165,204,493,569	13 55	
Jasper Simpson, voucher 420	15 00	
		28 55
CHEMICAL SUPPLIES.		
Heil Chemical Co., vouchers 460,501,566	28 35	
		28 35
SEEDS, PLANTS AND SUNDRY SUPPLIES.		
Storrs & Harrison, voucher 499	2 00	
Gilman & Dorsey, voucher 540	1 00	
Field Pump Co., voucher 500	65	
R. B. Gordon, voucher 449	1 05	
Loeb & Son, voucher 447,570	8 00	
C. B. Miller, voucher 422	1 50	
Peter Henderson, voucher 458	4 99	
McAlester Lumber Co., vouchers 164,495,567	10 91	
N. F. Murray & Sons, voucher 166	3 80	
R. U. Coombe, vouchers 282,456,496,539,565	21 25	
Plant Seed Co., vouchers 284,502	6 35	
Hickam & Estes, voucher 171	20	
Thorburn & Co., voucher 414	5 72	
J. C. Whitten, voucher 419	65	
F. B. Tumy, voucher 320	5 00	
J. C. Vaughan, vouchers 167,317,459	6 19	
Michel Seed Co., voucher 367	6 65	
Henry Kirtley, voucher 172	3 00	
Chas. A. Keffer, vouchers 173,281	3 75	
Wells, Higman Co., voucher 207	13 25	
Chas. Matthews, vouchers 245,318,461,504,544,568	31 70	
New Haven Nursery Co., vouchers 412,497	2 72	
Andy Johnson, vouchers 285,319	2 25	
		142 58
FERTILIZERS.		
Guitar & Neidermeyer, vouchers 316,421,450	9 00	
J. C. Whitten, vouchers 368,419	9 80	
Matt Douglass, voucher 451	1 20	
Arthur Strawn, voucher 452	2 40	
Thomas Ridgeway, voucher 453	1 10	
		23 50

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

FEEDING STUFFS.		
Farmers' Mill Co., vouchers 366,413,462,492,538	$49 25	
Boone County Mill Co., voucher 564	10 45	
Agricultural College Farm, voucher 541	9 80	
E. F. Henderson, voucher 248	5 25	
		$74 75
LIBRARY.		
"American Gardening," voucher 533	2 00	
Bradley Whidden, voucher 574	122 53	
		124 53
TOOLS, IMPLEMENTS, MACHINERY.		
Fred Bihr, voucher 416	19 50	
Miss M. E. Porter, Ex. voucher 455	23 70	
Chas. Matthews, voucher 461	3 15	
Field Pump Co., voucher 571	1 00	
		47 35
TRAVELING EXPENSES.		
C. A. Keffer, vouchers 173,206	42 25	
J. C. Whitten, vouchers 364,542,572	62 10	
		104 35
CONTINGENT EXPENSES.		
C. L. Norvell, vouchers 168,247	4 00	
Andy Johnson, vouchers 169,246	2 75	
Bell & Naylor, vouchers 170,205	8 75	
C. A. Keffer, voucher 173	1 35	
W. W. Hornberger, voucher 239	4 00	
R. B. Gordon, voucher 249	3 15	
R. U. Coombe, vouchers 365,415	7 50	
F. B. Tumy, voucher 369	2 20	
		33 70
BUILDING AND REPAIRS.		
Hickman & Estes, voucher 171	1 80	
W. W. Hornberger, voucher 498	3 00	
		4 80
		2,868 55
Department of Chemistry.		
SALARY.		
(Chemist was acting director for several months, and was paid salary accordingly.)		
P. Schweitzer	875 00	
		875 00
POSTAGE AND STATIONERY.		
W. G. Barrett, vouchers 209,464	18 75	
Burroughs & Vivion, voucher 253	4 15	
Gustav E. Stechert, voucher 331	12	
		23 02
FREIGHT, EXPRESS AND DRAYAGE.		
I. Switzler, Sec'y, voucher 446	11 70	
Gustav E. Stechert, vouchers 311,331,362	2 39	
		14 09
CHEMICAL SUPPLIES.		
Gilman & Dorsey, voucher 252	1 10	
Lyons Bros., voucher 254	2 40	
W. W. Hornberger, voucher 310	10 50	

DISBURSEMENTS IN DETAIL—BY DEPARTMENTS—Continued.

Heil Chem. Co., vouchers 330,466	$37 92	
Eimer & Amend, voucher 363	13 12	
		$65 04
SUNDRY SUPPLIES.		
C. C. Newman & Co., voucher 251	2 00	
		2 00
LIBRARY.		
Gustav E. Stechert, vouchers 208,255,311,331,362,575	228 97	
Chemical Pub. Co., voucher 576	3 00	
		231 97
TOOLS AND IMPLEMENTS.		
C. C. Newman & Co., voucher 251	1 05	
		1 05
SCIENTIFIC APPARATUS.		
Henry J. Green, voucher 465	32 85	
		32 85
		$1,245 02

NOTE: *Entomology*—This department opened in August, 1895
Fertilizer Control—This department opened in September, 1895.

Respectfully submitted,

IRVIN SWITZLER, Secretary.

Ordered that the report of the Agricultural College Committee be received, placed on file and the Committee be discharged.

The following matter was received from the Board of Curators, and was referred to the Executive Committee:

"Ordered by the Executive Committee of the Board of Curators of the State University of Missouri, that all papers referring to the insect pest known as San Jose Scale, be transmitted to the State Board of Agriculture by the Director, who will at the same time tender the aid of the Experiment Station in ina ugurating means for eradicating the pest."

On motion of Senator Bybee, the Veterinarian was required to give a bond of $1000 for faithful performance of his duties. Said bond to be filed with the Secretary and approved by the Executive Committee.

G. B. Lamm, of Sedalia, was introduced, and spoke of dairy interest and the enforcement of the butterine law.

He suggests that the State should be divided into dairy districts, and an agent appointed for each district for the enforcement of the butterine law, in lieu of the State agent, as now provided.

On motion of Senator Bybee, Mr. Lamm was invited to submit his plan in detail in writing, and the Executive Committee were requested to carefully consider the same and take such action as was deemed expedient.

REPORT OF AUDITING COMMITTEE.

We, the Auditing Committee appointed by President Maitland upon your order made at annual meeting, have carefully examined the books and vouchers of the Secretary and Treasurer, and find them correct, and the following amounts in the hands of the Treasurer to the credit of these funds:

Veterinary	$459 41
Farmers' Institute	342 10
Crop reports	94 91
Weather service	68 67
Distribution annual report	141 45
Office expense	50 43
Butterine	253 64
Expense of members	264 40

W. R. Wilkinson,
J. F. Groves,
D. A. Ely,
Committee.

On motion, the Treasurer was instructed to file his report in official form with the Secretary, subject to approval by the Executive Committee.

The following resolutions were offered and unanimously adopted:

Resolved, That it is the sense of this Board that a law should be enacted by next General Assembly compelling the transportation companies operating in this State to report to the Secretary of the State Board of Agriculture, on or prior to the 15th day of January of each year a statement of shipments of agricultural and mineral products made from the State during the year ending December 31st, prior thereto.

Whereas, The printing of the annual reports of this Board are as a rule delayed from five to six months after the preparation and delivery of the Mss. to the printer; therefore,

Resolved, That this Board would most respectfully urge that every effort should be made by the State Printing Commission to get these reports out at an early date.

The following resolutions by John W. Hill, of Chillicothe, were adopted:

Whereas, We note with sincere regret the death of Hon. H. C. Ireland, of Chillicothe, late member of the State Board of Agriculture.

Resolved, That in the death of Mr. Ireland, the cause of advanced agriculture has lost a devoted friend; the live-stock breeding interest a progressive and faithful champion, and the State a distinguished and incorruptible citizen.

Resolved, That the State Board of Agriculture hereby express its high appreciation of his virtues, and with sorrow and pain bow in humble submission to this decree of on all wise Providence.

Resolved. That our deepest sympathy be extended to the bereaved family, and that the Secretary be instructed to spread these resolutions on the record and to furnish the family and the press with a copy.

Prof. H. J. Waters offered the following which was adopted and ordered spread on the records of this Board:

Whereas, Prof. C. V. Riley was from 1866 to 1875 State Entomologist of Missouri, a position then filled by and under the control of the State Board of Agriculture; and

Whereas, Prof. Riley during his nine years service as Entomologist rendered most efficient service to the State and the farmers of the whole Mississippi Valley by tracing out the life histories of the most important insect enemies of the farm, and by suggesting and bringing to a practical working method easy and convenient means for combatting and overcoming the depredations of these formidable farm pests, leaving in his nine annual reports a monument alike to his ability, industry and zeal as to the honor of the Board that had called him to such important trust; therefore,

Resolved, That the Board of Agriculture has heard with regret of his untimely death at Washington, D. C.; and

Resolved further, That agriculture has lost in Prof. Riley a most able and conscientious helper and science, an investigator of uncommon merit. It is also

Resolved, That the sympathies of this Board be extended to the family of the deceased in their great loss.

Resolved, That the Secretary be instructed to furnish the family of the deceased with a copy of these resolutions, and that the same be spread on the records of the Board.

FARMS AND FARM LABORERS.

The following answers were made to questions submitted last year to four hundred crop correspondents. Replies were received from every county in the state, except Chariton, Franklin, Ste. Genevieve and Scott.

PER CENT OF LAND CULTIVATED BY TENANTS.

Of land in cultivation, the per cent cultivated by tenants, for the State at large, is 23; for northeast section, 20; northwest section, 25; central section, 23; southwest section, 26; southeast section, 23.

YEARLY RENTAL VALUE OF FARM LAND.

Where grain rent is paid for the use of land, the tenant gives, for corn, an average for the State at large, and for the northeast and central sections, 38 per cent of the grain produced; for southeast section, 35 per cent; for southwest section, 36 per cent, and for the north-

west section, 42 per cent; the lowest price paid being 33⅓ per cent, and the highest 50 per cent.

For oats in the State, and southwest and northeast sections, the share is 37 per cent of the crop; in the southeast and central sections, 36 per cent, and in the northwest, 39 per cent; the extremes, as in corn, being from 33⅓ to 50 per cent.

For wheat, an average of 37 per cent is paid as rent in the State, and in central and northeast sections; 33 per cent in the southeast; 35 per cent in the southwest, and 39 per cent in the northwest.

For the use of cotton land, 35 per cent of the crop is paid in the State at large; 37 per cent in the southeast section, and 32 per cent in the southwest section, these being the only localities in which it is produced.

Tobacco land commands 36 per cent of the crop in the State at large; 35 per cent in the southeast section, and 39 per cent in the southwest and central sections, and 33⅓ per cent in the northwest and northeast sections.

Potato land commands 37 per cent of the crop for the State at large, the southwest and northeast sections; 39 per cent for the northwest section; 34 per cent for the southeast section, and 40 per cent for the central section.

Meadows are rated at a rental value of 47 per cent of the crop for the State at large and the northwest section, and at 46 per cent for the southeast, southwest and central, and at 48 per cent for the northeast section; the general price in all sections being one-half of the crop, which is reduced by an occasional report from some locality of one-third rent.

Flax lands rent for 39 per cent of the crop for the State at large; 33 per cent for northeast section; 50 per cent for northwest section; 35 per cent for the central; 38 per cent for the southwest, and 42 per cent for the southeast section.

CASH PRICE FOR USE OF LAND FOR DIFFERENT CROPS.

The average cash price paid for the use of corn land in the State at large is $2.90 per acre; for oat land, $2.35 per acre; for wheat $2.60; for cotton, $3.50; for tobacco, $3.95; for potatoes, $3.60; for meadows, $2.80; for flax, $2.10, and for pastures, $1.85.

For the northeast section, the average price of corn land is $2.90; for oats, $2.35; for wheat, $2.40; for tobacco, $7.50; for potatoes $3.30; for meadows, $2.60; for flax, $2, and for pasture, $1.80.

For the northwest section: corn land, $3.30; oats, $2.40; wheat,

$2.65; tobacco, $3; potatoes, $3.85; meadows, $2.60, and pastures, $2.10.

Central section reports corn land worth $2.95 per acre; oats, $2.20; wheat, $2.65; tobacco, $2.95; potatoes, $3.10; meadows, $3; flax, $1.75, and pastures at $2.05.

Southwest section estimates corn land at $2.35; oats, $2.15; wheat, $2.35; cotton, $3.75; potatoes, $3.05; meadows, $2.85; flax, $2.60, and pastures, $1.70.

Southeast section says corn land is worth $2.95; oats, $2.65; wheat, $2.85; cotton, $3.40; tobacco, $2.60; potatoes, $3.55; meadows, $3.15, and pastures, $1.60.

INCREASE OR DECREASE OF FARM LABORERS.

From 94 points in the State farm laborers are reported more plentiful than heretofore, while 59 localities estimate them the same and 36 say there are less. At the points reporting less the laborers are probably engaged upon public works. In some instances this is cited as a reason. Northeast section gives 23 points with more laborers, 12 the same and 5 with less.

Northwest, 17 points with more, 13 the same, 6 less.

Central section gives 19 localities with more, 13 the same, 7 less.

Southwest section reports 17 localities with more, 12 with the same and 10 with less.

Southeast section, 18 points with more laborors, 9 the same and 8 with less.

CAN FARM LABORERS OBTAIN WORK ALL THE TIME?

For the State, 142 points report that farm laborers can obtain work only for from 4 to 10 months in the year, while 53 localities report work all the time.

The northeast section reports work all the time from 11 points, and but part of the time from 37 places.

The northwest section says work all the time from 11 localities, and only a part of the time from 24 points.

Central sections estimates work all the time from 16 localities, and from 20 points from 4 to 10 months.

Southwest section says work all the time from 4 points, and part of the year only from 36 localities.

Southeast section says continual work from 11 places, and employment from six to eight months from 25 points.

REASONS FOR NON-EMPLOYMENT OF FARM LABORERS.

Among the reasons offered why farm laborers are not employed all the time are, "scarcity of money," "financial depression," "want of confidence in business stability," "unprofitable prices of farm products," "demonetization of silver," etc., a large majority claiming the crops produced with hired labor at prevailing prices are unprofitable, and hence they are employed only in cases of emergency.

WAGES PAID.

The average price paid farm laborers, with board, for the State at large is $13.95 per month, and without board, $19.55.

The northeast section pays an average of $14.75 per month with board, and $20.70 without board.

The northwest section pays an average of $16.45 with board, and $22 without.

Central section, $13 with board, and $18.65 without.

The southwest section pays $13.30 with board, and $18 without.

The southeast section pays $12.25 with, and $17.80 without board.

HAVE WAGES INCREASED OR DECREASED IN LAST FIVE YEARS?

For the State at large, 98 localities report a decline in wages, 56 report same wages, and 11 points report an increase. The northwest section notes the fewest points with a decrease, and the southeast the greatest number. The northwest and southeast sections give each two points with an increase of wages, the central and northeast three localities, the southwest one point.

INCREASE OR DECREASE OF UNEMPLOYED FARM LABORERS.

The State from 100 localities reports an increase of unemployed farm laborers, from 42 localities the same number, and from 27 points a decrease in number of unemployed.

The northeast section reports an increase from 20 points, and a decrease from eight. The northwest section, an increase from 16 points, and a decrease from seven. Central section, an increase from 24 localities, and a decrease from three. The southwest, an increase from 18 places, and a decrease from five. The southeast, an increase from 22 points, and a decrease from four.

COST OF LIVING

Is said to have decreased at 144 points, and to have increased at 22 places. The increase is, in some instances, accounted for by advance in house rents, etc.

FARM LABORERS.

The average number of hours required of farm hands for the State at large and all sections is 11, and the almost unanimous opinion of correspondents is that they do not and could not save money at prevailing prices, after decently supporting their families. A few young men without families and without bad habits, and by practicing economy, may save some money. A very few families blessed with health, and when the good wife and children lend assistance in earning a support, may also accumulate some property, but these are rather rare exceptions. The great bulk of laborers are Americans, followed by German and Irish in the order named.

THE COST OF PRODUCING THE FOUR STAPLE CROPS.

CORN.

The estimated cost of producing an acre of corn is for the State, $7.65; for the northeast section, $7.75; for the northwest section, $7.95; for the central, $7.95; the southwest, $7, and the southeast, $7.65.

This estimate includes the rental value of the land, seeding, cultivation, husking and delivering to market not to excede a distance of four miles.

The difference in cost between sections is occasioned more by the difference in the rental value of the land than by the cost or manner of tillage.

Table showing yield of corn, cost of production and rental value per acre of land and cost per bushel by the State and by sections for 1895:

	Yield per acre in bu.	Cost per acre.	Rent per acre.	Cost per bushel.
State	38	$7 65	$2 90	.20.1
Northeast	40	7 75	2 90	.19.3
Northwest	43	7 95	3 30	.18.5
Central	41	7 95	2 95	.19.4
Southwest	33	7 00	2 35	.21.2
Southeast	38	7 65	2 95	.20.1

WHEAT.

The wheat yield for 1895 was 27 points below an average, and to this extent the cost per bushel, as shown in the table below, is increased. Had the yield been up to the normal, the cost per bushel for the State would have been reduced from 68.1 cents per bushel to 50 cents, and could the average be increased to 20 bushels per acre, as it doubtless could be were it not for the ravages of chinch bugs, the average cost per bushel would be less than 40 cents. In the southwest section where these pests first commenced their depredations in 1895, and where they were more generally distributed it will be noted that the average yield was reduced to 7.5 bushels per acre, and the cost per bushel increased to 95.3 cents, or approximately double the price the farmer could have obtained for it at the nearest railroad station.

The farmer might also note with profit that the cost of producing an acre of his crops with a maximum yield, where the conditions are favorable, is but little more than for a mimimum yield, and that upon one he may make a handsome profit while upon the other he is not reimbursed for his investment. The necessity for adopting such a rotation of crops as will best conserve soil fertility, keeping the ground in perfect tilth, and applying the best thought to the cultivation of crops with a view of achieving the highest possible results, is so apparent that it should not be neglected.

While an average crop would have paid the cost of production, less than that is produced at a loss.

The farmer who produces an average crop receives rent for his land and current prices for their labor, while those who produce less either lose their rent or work for less than their neighbors were paying for the same service.

Agriculture will be profitable to the individual when, in an economical manner, he produces more than an a verage crop ; and so with the State. When a greater quantity of the product of equal quality can be produced for less money than elsewhere, being favored with equal shipping facilities, agriculture will prosper, otherwise it will decline.

Table showing yield of wheat, cost of production and rental value of land per acre, and cost per bushel for the State and by sections for 1895:

	Yield per acre in bu.	Cost per acre.	Rent per acre.	Cost per bushel.
State	11	$7 50	$2 60	.68.1
Northeast	11.5	7 75	2 40	.67.4
Northwest	13	7 60	2 65	.58.4
Central	12	7 45	2 65	.62
Southwest	7.5	7 15	2 35	.95.3
Southeast	11	7 65	2 85	.69.5

TOBACCO.

The estimate made of the cost of producing an acre of tobacco, as given in the table below, includes the rent of land, preparation of ground, cultivation, cutting, curing, stripping and delivering to local buyer. To approximate correctness, where all these conditions are considered, is a difficult task and but few correspondents have undertaken it. But those who did were familiar with all the details, and have given the subject careful consideration.

The average price given for the State is 05.6 per lb. and the cost of production 04.5 per lb., leaving a profit to the producer of a little over one cent per lb., or about $7.50 per acre. As a great part of this work is done by children and cheap labor, it would appear that the cultivation of tobacco might be extended with profit in localities where the soil and other conditions are favorable to the production of a good quality of tobacco.

Table showing cost of production, yield and rental value of land per acre for tobacco and the cost per lb. for the State and the sections in which it was produced in 1895:

	Yield per acre in lbs.	Cost per acre	Rent per acre.	Cost per lb.
State	745	$33 50	$3 95	.04.5
Northeast	850	31 50	7 50	.03.7
Northwest	800	34 00	3 00	.04.2
Central	650	33 50	2 95	.05.1
Southwest	525	.....	.....	.....
Southeast	700	35 00	2 60	.05.1

COTTON.

The estimated cost of the production of an acre of cotton includes rent of land, seeding, cultivation, picking and delivering to the cotton gin. The seed will pay for ginning and baling, leaving the proceeds to apply on the items above mentioned.

Table showing cost of production, yield and rental value of land per acre for cotton, and cost per lb. for the State and the two sections in which it is produced in 1895:

	Yield per acre in lbs.	Cost per acre.	Rent per acre.	Cost per lb.
State	253	$13 25	$3 50	.05.2
Southeast	253	14 98	3 40	.05.9
Southwest	253	11 55	3 75	.04.6

PROFITS ON FARM LAND.

The opinion of correspondents is very general that farmers, after paying taxes and keeping up repairs, with farm labor and farm products at prevailing prices, are making but little, if any, profit on the money invested in lands. The average profit for the State at large, as estimated by those who claim there is a profit on the investment, is fixed at 3 per cent; with the northeast section 3-4 per cent; the northwest at 5 per cent; central at 3-7 per cent; the southwest 1-7 per cent; and the southeast at 3 per cent.

These conditions are not so favorable for the farmer or farm laborers as they should be. In Missouri, with favorable climatic conditions, with a diversity of soil, where the great agricultural staples are produced in abundance, with a fruit belt unsurpassed, with a fabulous wealth of minerals, with her great cities and their industries, with her railroads and rivers, her light tax levy, farming should be profitable, and the farm laborer should be properly remunerated. A fact that might be noted by the casual observer for the last several years, is that prices are profitable on farm products only when the supply is practically exhausted and that, when offered in such quantities as to supply the demand and bring to the farmer returns for his labor and a profit upon his investment, he is confronted with such a decline in the market as to shatter his hopes and rob him of a suitable reward for his efforts. Whether these conditions are caused by monopolies and combinations

of capital, and if this is a reason, if it is the only one, and what is the best and most practical remedy for the evils that affect the farmer, if he is unfavorably affected, are questions that may be profitably considered by the intelligently agriculturist, with a view of offering a solution that will give him relief and restore to him that prosperity to which the owner and the industrious tiller of the soil is entitled.

There are many reasons why we should have confidence in the ultimate prosperity of the Missouri farmer. If legislation or commercial conditions are against him, he is not affected to the extent that others are who are not so fortunately or favorably situated. What may prove burdensome and oppressive to others may be but slightly felt in Missouri. While our people may solve existing troubles, others may be forced to do so.

When the causes of agricultural depression are determined, when these questions are settled beyond further controversy, when a proper diagnosis is reached and a united and determined people ask for a vigorous and heroic treatment, relief will come speedily and with certainty.

There is no doubt but this day is in the near future, and with relief from oppressive discrimination, with an open field, a fair fight and an even start, Missouri agriculture will blossom as the rose and bring to our people sunshine and prosperity.

STATE VETERINARY SERVICE.

The State Board of Agriculture has charge of the Veterinary Service of the State, the appointment of the State Veterinarian, and, with his advice, of the deputies, inspectors and other assistants.

The Service is available to any citizen of the State for the suppression of any "contagious or infectious disease amongst live-stock, and to the State Board of Health for examinations they may deem necessary in such infectious or contagious diseases as are transmissible to the human family."

Applications for the services of the State Veterinarian must be made to the "Secretary of the State Board of Agriculture at Columbia, must allege the existence of a dangerous infectious disease amongst the stock of the vicinity, must be signed by ten freeholders whose reputableness must be certified to by a clerk of some court of record or some justice of the peace."

Applications from the State Board of Health must be signed by its president and secretary.

The Board also formulates the quarantine regulations for the purpose of protecting the cattle of this State against Texas or Splenic fever. These regulations forbid the introduction of cattle from south of a certain described quarantine line into this State, except for immediate slaughter or in transit through the State, and in such cases their movement is carefully guarded so as to prevent the spread of infection. Cattle from south of quarantine line as described, and since date fixed in Governor's proclamation "cannot be transferred on foot into or through the State, nor kept, grazed or watered on public ranges, unfenced lands, highways or State lands."

Cars carrying southern cattle into or through the State are required to bear a placard stating the fact, and each way-bill shall note on its face a similar statement, and when unloaded, either for sale or slaughter, or for feed or water, are required to be placed in separate pens, designated as "southern cattle pens," from which they are removed only under carefully guarded regulations.

Live-stock inspectors are placed at St. Louis, Kansas City and St. Joseph who promptly take charge of all cattle shipped from south of the quarantine line, see that they are placed in pens set aside especially for southern cattle and that they are removed only on a permit, issued by them, to take the cattle to pens for immediate slaughter or for transportation to other states. The disinfection of cars and pens before being used for stock other than southern cattle is also carefully looked after.

This inspection, under careful regulations, prevents the purchase of southern cattle by the speculators or others who would remove them to our rich pastures for the summer or till such time as an advance in the market would make the investment profitable, thereby spreading the infection to the herds of this State, causing a loss of thousands of native cattle and a decline in the value of our cattle for export purposes. Nothing but the most vigilant care by experienced men has been able to control the unlawful handling of southern cattle at the points where inspectors have been placed and prevent the driving or shipping to interior points of thousands of infected cattle for summer grazing or feeding. But so efficiently has this work been done that no outbreak of Texas fever from cattle brought into this State through these channels has occurred in years.

In Jasper and Newton counties, bordering on infected territory, and at a point where we were unable to keep an inspector heretofore, by reason of an insufficient appropriation, cattle have been freely handled in violation of quarantine regulations. This had been carried on so long and to such an extent that territory around Joplin in Jasper

county and Seneca in Newton county had become permanently infected with this germ and the United States Department of Agriculture promptly quarantined against both counties.

That the reputation of Missouri cattle might not suffer, that cattle feeders in these counties might have relief and, finally, that we might be able to extirpate the infection from our State, we have located an inspector at Joplin. Cattle that are not suffering from the disease or are not capable of spreading the infection are passed out on permits issued in co-operation with the Government Inspector, to the native yards and sold as native cattle.

Again, as the Board of Agriculture had no authority to quarantine against counties of this State, our quarantine line follows the State line between this State and Kansas and the Indian Territory. It has been the custom of cattle dealers to supply the butcher shops of Joplin and other mining towns in these two counties with cattle purchased in the Indian Territory and smuggled into these counties in violation of the quarantine regulations.

It was from this source that this infection was introduced into these counties, and the continued traffic for several years, and by the purchase of large bodies of cattle that were turned on the range and were drawn upon as the butchers might need them, that permanent infection was finally established. Around the mining districts in these counties the country is generally rough, much of it covered with timber, and it was upon this ground that cattle from the Territory were permitted to range through the summer and early winter. Texas ticks, generally admitted to be the cause of, or the channel through which this infection is communicated, drop from the cattle, crawl beneath the heavy coat of leaves that cover the ground to the depth of several inches and are thus protected from winter frosts and are spared to spread the malady the next season. The last winter was a very severe one in the locality of these counties, the temperature closely approximating 20 degrees below zero, and as the timber had been mostly burned over last fall, thus doing away with the protection afforded the ticks heretofore, it is hoped that the infection may be extirpated, and if quarantine regulations are closely observed in the future, that we may be entirely relieved of his disastrous invasion that seriously threatened the cattle industry of this State.

The Inspector at this point is thoroughly competent, full of energy and earnestly devoted to the work before him. If supported by the people of these counties, who should be directly interested in stamping out this infection, he will, no doubt, promptly enforce the quaran-

tine regulations and stop the traffic in cattle from infected area that has planted this infection on our soil.

The Veterinary Service is also required to look after cases of glanders, farcy, tuberculosis, contagious pleuro-pneumonia, rinderpest, foot and mouth disease, or any other diseases of a dangerous, contagious or infectious character, and the Veterinarian may, where his judgment so directs, quarantine against all animals so affected.

Section 8783 makes provisions for the destruction of and indemnity for animals affected with glanders, *maladie du coit*, contagious pleuro-pneumonia, or rinderpest. The law in relation to these cases was slightly amended by the 38th General Assembly. The former law in addition to quarantine by the State Veterinarian required quarantine by the sheriff. This is now unnecessary as the quarantine by the veterinarian is final, and the sheriff visits the stock only for purpose of destroying it. The indemnity for slaughtered animals was reduced to correspond to the decline in prices of live-stock.

Glanders has been a source of great trouble to the Service. This dreadful disease was confined to no locality, but was well over the State, and from the fact that an animal may be affected in chronic form, and yet do service and keep in fair condition for years, be traded from one neighborhood to another, spreading the disease wherever he goes, and yet from his good service as a work animal and his apparently healthy condition, never for once be suspected as the source of the trouble, renders complete extirpation difficult and uncertain.

The payment of a nominal sum for animals slaughtered on account of this trouble, has been a material aid in enabling the Department to get hold of infected animals, as but few men would surrender their animals for examination and slaughter without prospect of some remuneration, as they could more profitably dispose of them by trading them to someone who did not suspect the presence of this terrible malady. While the integrity and honor of some men would prevent them from disposing of an animal affected with a dangerously contagious disease, it is to be regretted that there are others whose scruples or conscience would not be in the way of such a transaction.

Only those who have endeavored to execute this law and effect a complete eradication of glanders from the State can appreciate fully the difficulties and obstacles that are met with in a great number of cases.

However, we are now beginning to note the effect of the Service in this direction. Calls are far less frequent than formerly. The territory affected in not so extended as heretofore. Thorough investigation in answer to many calls proves that glanders does not exist in the

vicinity. It is expected that this season will show a greater decrease in the number of actual cases of glanders than any year since the organization of the Service.

For the benefit of those who may need the service of the State Veterinarian, I herewith publish the law in full. Particular attention is called to the fact that his services are obtained by "petition signed by ten freeholders," addressed " by mail or otherwise to the Secretary of the State Board of Agriculture," and that his service is intended for the control of contagious and infectious maladies, and that the petition should allege the supposed existence of such disease.

It is not expected that the State will furnish a veterinarian free of charge for the treatment of all the ills and ailments of the live-stock of the State. Only such diseases as are contagious or infectious and are liable to spread to other herds and for this reason become of interest to the general public are expected to be looked after by this Service at the expense of the State. All other cases should be treated by your local veterinarian at the expense of the owner, and apply for the State service only when the public interests are threatened.

LAWS GOVERNING STATE VETERINARY SERVICE.

SECTION 8775. The State Board of Agriculture of the State of Missouri shall appoint a veterinary surgeon to aid and assist in developing and protecting the live-stock interests of the State of Missouri. Said veterinary surgeon shall be a graduate of some reputable and recognized veterinary college or school, and shall give to the said Board of Agriculture, before his appointment, good evidence of a recognized practical and scientific knowledge of contagious and infectious diseases of live-stock, and shall hold his office for a term of four years, or until removed by said Board of Agriculture for cause, as hereinafter provided.

SEC. 8776. Said veterinary surgeon shall, before entering upon the discharge of his duty, file with said Board of Agriculture his oath of office, with a satisfactory and sufficient bond for the faithful performance of his duty, and for security for the public funds that he may in anyway dispose of or draw upon. Said veterinary surgeon shall have his office with or near the office of the State Board of Agriculture ; shall act only as an expert, and he shall, when practicable, devote all the time possible to the investigation of the nature of, causes of and remedies for the diseases of domestic animals, and he may at

any time, if he deems best and useful, cause scientific, practical investigations to be made, and shall teach the knowledge thus obtained from such investigation of the nature and causes of diseases and the results of such scientific, practical investigation to the students of the Agricultural College. The Secretary of the State Board of Agriculture shall assume charge of all clerical work pertaining to the veterinary service.

SEC. 8777. Said veterinary surgeon shall be under the control of the State Board of Agriculture, who may remove him whenever, in their judgment, the good of the veterinary service of the State may demand it.

SEC. 8778. It shall be lawful for any ten freeholders, residents of this State, to go before any clerk of a court of record or justice of the peace and demand the presence and services of said veterinary surgeon in the following manner:

State of Missouri, }
County of ——. }

To the Secretary of the State Board of Agriculture, Columbia, Missouri:

We, the undersigned citizens, freeholders of the county of ——, believe that there exists in this locality a dangerous infectious disease among (here name the kind of stock, the name in full of the party owning the same or in charge thereof, the part of the county in which it is situated, together with the nearest railroad station and postoffice address, and full directions as to the best and most expeditious way for the veterinary surgeon to reach said stock); therefore we request the presence of the State Veterinary Surgeon.

[SEAL] —— ——.
[SEAL] —— ——.

Which petition may be certified to in the following manner:

State of Missouri, }
County of ——. }

I hereby certify that the above-named petitioners are known to me to be reputable citizens of this county.

(Signed by the clerk of said court or justice of the peace, and attested by his official signature, giving day of the month and the year.)

The State Board of Health may demand of the Secretary of the State Board of Agriculture, through their President and Secretary, the services of the State Veterinary Surgeon to aid them in the inspection of such infectious or contagious diseases as are transmissible to the human family, and in examination of meats, milk and foods, when, in the judgment of said Board of Health, the assistance of this officer is necessary.

SEC. 8779. Such petition may be forwarded by mail or otherwise, as said petitioners may elect, to the Secretary of the State Board of Agriculture (wherever his office may be located), who shall cause a

thorough investigation to be made by or under the direction of the State Veterinarian, as the latter officer may deem best.

SEC. 8780. Said veterinary surgeon may also, on information satisfactory to himself, visit any locality in this State, without receiving any petition as provided for in the preceding sections, where he may think his presence necessary to the protection of live-stock interests of this State, and make a thorough investigation as to the health and condition of the live-stock of that locality.

SEC. 8781. If, upon investigation, said veterinary surgeon shall be satisfied that such live-stock is suffering from or infected, or capable of infecting with or causing what is known as glanders, farcy, tuberculosis, contagious pleuro-pneumonia, Texas fever, rinderpest, foot or mouth disease, or any other dangerous disease of a contagious, infectious or spreading character, against which he may think best to quarantine, he shall immediately quarantine the same by placing it in pens, barns or sheds, completely separated from other susceptible stock not diseased or infected, until such diseased stock shall be disinfected or completely recovered and its release ordered by the State Veterinary Surgeon, or his deputies, or shall have been killed or disposed of as hereinafter provided; and all barns, sheds or pens containing the diseased stock shall be surrounded with a good and sufficient fence to prevent any other stock from approaching nearer than one hundred feet to the barn or pen containing such diseased stock, unless the said veterinary surgeon is satisfied that it is impractical to quarantine as herein set forth, then he shall prescribe in writing such other rules and regulations as he may deem best. He shall thereupon make out in writing a notice and deliver it to the owner or person or persons in charge of said stock, setting forth the number and kind of stock so diseased, with the nature and character of the disease, with a peremptory order that said live-stock shall not be moved from the locality where placed under this order until released by said veterinary surgeon, or until the arrival of the sheriff with orders for the destruction of said diseased or infected stock, as hereinafter provided. He shall also immediately notify the county court, or the court of criminal correction, or other court with similar power, if the case be in a city where no county court exists, or two judges thereof in vacation, of the county in which said diseased stock may be found, setting forth in writing the number and kind of stock infected or affected, and the character and type of the disease, with the name of the person or persons in charge of said stock. He shall also give to the said court notice of any charge that he may have made in the manner of quarantine, together with a copy of the rules substituted therefor. The

said veterinary surgeon may, in his discretion, order owner or owners, or person or persons, in charge to bury or burn carcasses of dead animals, and such persons thereupon shall execute such orders as prescribed.

SEC. 8782. It shall be lawful for any citizen of this State who shall own animals affected with either glanders, and farcy maladie du coit (or horse syphilis), contagious pleuro-pneumonia, or rinderpest, and who shall have the same in quarantine under this article on account of either of said diseases, to appear before the county court, or a court of criminal correction or other court, as specified in section 8781, having jurisdiction in the locality in which said disease shall exist, and to present evidence why said diseased stock should be slaughtered and compensation granted, as hereinafter provided.

SEC. 8783. Whenever a county court or court of criminal correction, or other court mentioned in section 8781, in session, shall find from the evidence presented by any citizen of this State, as provided for in section 8782 of this article, that said citizen is the proprietor of any animal affected with glanders or maladie du coit, or contagious pleuro-pneumonia, or rinderpest; and that said animal is in quarantine under this article, and that said animal became so diseased accidentally and not through any inhuman or gross and willful neglect or scheming on the part of said proprietor that said diseased stock was not already diseased when it came in possession of said proprietor; that said diseased stock did not come already affected with said disease from another state, or from any territory, or from any other country; that said diseased stock had not been exposed outside of Missouri, three months prior to its importation in this State, to any of said contagious or infectious disease, it shall be the duty of the said court to appoint three disinterested parties, who shall be stock owners, to go and appraise said diseased and quarantined stock. Said appraisers, bringing with them the sheriff, shall at once proceed to the locality where said quarantined stock shall be, and there make the appraisement, taking into consideration the condition of said stock, also the disease with which it is affected, in determining its value, and immediately report the same, in writing, to said court: Provided, that in cases of glanders reported to the court by the State Veterinarian as acute, the appraisement shall not exceed five dollars each; that in case of glanders reported by State Veternarian as sub-acute, the appraisement shall not exceed fifteen dollars for each animal; that in cases of glanders reported by the same officer as chronic, the appraisement shall not exceed twenty-five dollars for any case; that the appraisement of any stock, for any disease, for which indemnity may be paid under this sec-

tion, shall not exceed thirty dollars for each animal. Said sheriff shall, after appraisement, kill said stock and order the same burned or buried by the proprietor, and he shall embody a description of the same animals with the report of the appraisers to said court. Said court, upon receipt of such appraisement, shall report the same to the Governor, and the Governor shall endorse thereon his order to the State Auditor for payment of the same; thereupon the State Auditor shall issue his warrant for the same on the State Treasurer.

SEC. 8784. Whenever the State Veterinary Surgeon shall have sufficient evidence to satisfy him that any private or public or corporate barn, or shed, or stock car, or any pen, yard or field is infected and so injudiciously used as to be liable to convey contagious or infectious disease to live-stock, he shall prescribe in writing, to the owner or owners, or person or persons in charge thereof, the most rapid of the effective modes of disinfecting or cleansing deemed necessary; and shall prohibit, also in writing, to the owner or owners or persons in charge, the occupation by susceptible live-stock, or the removal of such infected property as may be movable, until such disinfection has been thoroughly carried out, and that the danger of conveying contagious or infectious disease is removed. Such cleansing and disinfection shall be at the cost of the owner or owners. The State Veterinary Surgeon may call for help on the county court, if necessary, and the court shall thereupon order the sheriff or other officer to give the assistance necessary to enforce the law.

SEC. 8785. The Governor of Missouri may, in his discretion, order said veterinary surgeon to visit any state or terrritory and investigate any dangerous or infectious disease said to exist in any designated locality in the state named, and report to the Governor the result of said investigation, together with such suggestions that he may deem proper and right. On receipt of such report, or any official report of the State Veterinarian, the Governor may call the State Board of Agriculture and the State Veterinary Surgeon together, and that body and said veterinary surgeon may, if deemed wise, arrange and adjust such rules and regulations as safety may demand for the transportation of live-stock through or into this State from any state or territory, or any foreign country or parts thereof, where dangerous contagious or infectious disease may exist. Such rules and regulations shall not be in contradiction with constitutional laws of transportation and commerce, and shall be subject to the approval of the Governor. The Governor, on the approval of such rules and regulations, shall issue his proclamation, scheduling and quarantining against such localities in which domestic animals may be considered as capable of conveying infectious

or contagious diseases, and prohibit the importation and the unloading in this State of any live-stock of the kind capable of causing such disease, except under the aforesaid rules and regulations. Such rules and regulations, after approval by the Governor, shall be sent to all corporations or other agencies doing the business of transportation or conveying live-stock through or into the State of Missouri, and any corporations or agencies or individuals who shall violate such rules and regulations by transporting prohibited animals, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $1000 nor more than $10,000 for each and every offense, and shall be liable for any and all damages or loss that may be sustained by any party or parties by reason of such importation or transportation. Such penalty shall be recovered in any county in this State into or through which stock is brought, upon information filed in the circuit court of any such county.

SEC. 8786. The Governor, when informed by the State Veterinarian that either cantagious pleuro-pneumonia, rinderpest, foot and mouth disease or maladie du coit has become largely disseminated or epidemic among domestic animals throughout any municipality or geographical district within this State, may call the State Board of Agriculture and the State Veterinarian together, and said Board and veterinary surgeon shall, if deemed necessary to prevent the spread of such disease formulate for the State Veterinary Surgeon and the county courts rules and regulations under which stock capable of conveying the said disease shall be permitted to move to other parts of the State. Such rules and regulations shall be subject to the approval of the Governor, who thereupon shall issue his proclamation scheduling and quarantining such said localities, and forbidding the conveying or transportation or moving of all domestic animals of the kind diseased from such district to another, or from one premises to another, or over any public highway or any lot or ground not sufficiently fenced to prevent animals from going through or being brought into such infected districts except in accordance with the aforesaid rules and regulations. The county court or other legally substituted court of the county in which such infected locality or district shall have been quarantined by the Governor, shall be notified by the State Veterinary Surgeon and furnished with copies of said regulations. Said county court shall thereupon comply with said rules and regulations, and issue orders to the sheriff to assist said veterinary surgeon in carrying out the provisions of the same.

SEC. 8787. Any person or persons who shall in any way interfere with or obstruct said veterinary surgeon in the discharge of his duties,

or any owner or owners, person or persons who shall be notified to quarantine the same as provided in this article, and who shall violate any of the provisions thereof, or any person or persons who shall violate any of the provisions of this article regarding district or municipality quarantine, shall be guilty of a misdemeanor and punished by a fine of not less than $50 nor more than $500, or by imprisonment in the county jail not less than one month nor more than one year.

SEC. 8788. All fines recovered under the provisions of this article shall be paid into the county treasury of the county in which the suit is tried by the person collecting the same in a manner now provided by law; and it shall be the duty of prosecuting attorneys in their respective counties to prosecute for all violations of this article.

SEC. 8789. The said Board of Agriculture and Veterinary Surgeon shall co-operate with any commissioner or other officer appointed by the United States for the suppression of contagious diseases among domestic animals, so far as the provisions of this article and the appropriations made in accordance therewith will allow, in suppressing and preventing the spread of contagious and infectious diseases among domestic animals in this State.

SEC. 8790. Said Veterinary Surgeon shall report to the Secretary of the State Board of Agriculture, in writing, at least once in every three months, setting forth the locality or localities visited, as provided in the preceding sections, the kind of stock treated, the type and character of the diseases, the remedies prescribed and the results, so far as known, of such treatment. The Secretary of the State Board of Agriculture shall from time to time, as often as may be required, select from said reports and publish in a concise form such information as he may think valuable to the people of Missouri. This information may be published in connection with the reports relating to agriculture or in separate bulletins.

SEC. 8791. It shall be the duty of the Secretary of the State Board of Agriculture to collate and compile, briefly and concisely, the useful and interesting information derived from the veterinary sanitary service, as provided for in this article, and report to the General Assembly within ten days of the date of the meeting thereof, together with such suggestions as may be beneficial to the agricultural interests of the State.

SEC. 8793. Whenever the State Veterinary Surgeon shall find it impossible to perform alone, in an effective manner, the duty imposed by this article, he shall appoint, as may be needed, one or more deputy State veterinary surgeons, who shall be competent veterinarians, graduates from some reputable veterinary school or college. Such deputy

veterinary surgeon shall have, when on duty, the same power and same protection as now provided in this article for the said veterinary surgeon, and shall work under his direction and instructions. Such appointments shall be subject to the approval of the State Board of Agriculture. Said State Veterinary Surgeon may also employ non-professional men and special experts as agents or inspectors whenever such a means shall become absolutely necessary to carry out this law properly or enforce the regulations of quarantine as possible in cases of emergency provided against by sections 8785 and 8786 of this article.

SEC. 8794. The State Veterinary Surgeon shall receive for his services the sum of $1800 per annum, and also his necessary traveling and incidental expenses in the discharge of his professional duties, payable out of the funds provided for the maintenance of the veterinary service, quarterly or oftener, as the Board may direct. The deputy veterinary surgeons shall receive $7 per diem and traveling expenses and incidental expenses necessary in the performance of their duties, for each and every day actually and necessarily employed under this law, payable, also, by said Board of Agriculture out of the appropriation for the veterinary service. Said State Veterinary Surgeon shall render account to said Board of Agriculture for the number of miles traveled by himself, deputies or inspectors, the help employed, and the cost thereof, and all the incidental expenses incurred in working under this law. Said account or accounts shall be audited, and, if found correct, shall be allowed as now provided by law.

ANIMALS—CONTAGIOUS DISEASES.

AN ACT REGULATING THE DISPOSAL OF DEAD BODIES.

Be it enacted by the General Assembly of the State of Missouri, as follows:

SECTION 1. That it shall be unlawful for any person or persons to engage in hauling the carcasses of swine, sheep, cattle and horses that may die of any contagious or infectious disease, or to sell, buy or give the same away.

SEC. 2. That the owners of such domestic animals that may die of any contagious or infectious disease are hereby required to keep the carcasses of all such animals upon the premises of said owners, and shall in no case be permitted to sell or give such carcasses away, or remove the same, except as hereinafter provided.

SEC. 3. All owners of such domestic animals that may die of any contagious or infectious disease shall be required to dispose of the

carcasses of such animals by burying, burning or removing said carcasses to some place upon said owner's premises as remote from public roads and highways and the stock lots, pastures and feeding places used by adjoining land and stock owners for lotting, pasturing and feeding domestic animals as circumstances will permit: Provided, that nothing contained in this act as interfering with the rights of any city, incorporated town or village making such disposition of carcasses of such animals as may die or be found dead within the corporate limits of any such city, town or village, as the municipal ordinances and regulations of such cities, towns and villages may provide.

SEC. 4. Every person who shall violate any of the provisions of this act shall be adjudged guilty of a misdemeanor, and upon conviction thereof shall be fined not less than ten nor more than fifty dollars.

QUARANTINE MEETING.

JEFFERSON CITY, Mo., March 6, 1895.

State Board of Agriculture met for quarantine purposes in office of Governor.

Members present—Alex. Maitland, President; Gov. Wm. J. Stone, Prof. John R. Kirk, D. A. Ely, Eugene Rhoades, W. R. Wilkinson and J. T. Donovan.

Albert Dean, Inspector for United States Department of Agriculture, was present and was requested to state reasons for Government quarantine against the counties of Newton and Jasper in this State. Representatives Sailor and Dr. Hancock of these counties were present, and the conditions and the future of the cattle industry of that locality were fully discussed.

Don Palmer, Supt. of Union Stock Yards of St. Louis, was present and discussed the propriety of driving southern cattle through the streets of St. Louis.

On motion, the following resolutions were adopted:

Whereas, The United States Department of Agriculture has, upon careful investigation, declared the counties of Jasper and Newton of this State to be permanently infected with southern or splenetic fever, and has by proclamation dated February 5th, described a quarantine line for 1895, including these counties in the infected area, and requiring cattle therefrom to be shipped and handled as southern cattle.

Whereas, If this infection believed to exist in Jasper and Newton counties is not promptly controlled and extirpated, the infected area in this State will be extended, material and almost incalculable losses will occur to the cattle-feeders and

this question become one of grave and serious concern to the cattle industry of the State.

Resolved, That in the opinion of this Board the appropriation of $10,000 recommended by the House Committee of the 39th General Assembly for the support of the Veterinary Service for the next biennial period is insufficient for the protection of the live-stock interests of the State and for such prompt and efficient action as will thoroughly protect the State against the further introduction of splenetic fever infection or extirpate it from localities where it is now supposed to exist, and that the magnitude and importance of the live-stock industry and the serious and alarming conditions existing at this time demand an appropriation of $20,000 for the support of this Service for the next biennial period.

On motion, the quarantine line of the United States Department of Agriculture, as described in proclamation of February 15, 1895, be followed except as to the counties of Newton and Jasper in this State—quarantine to go into immediate effect (see proclamation of Gov. Stone of even date herewith.)

On motion of Gov. Stone, the Board urgently recommended the amendment of the law—section 8786—so as to give the Board of Agriculture control of the movement and transportation of infected cattle within the lines of this State.

QUARANTINE PROCLAMATION.

STATE OF MISSOURI,
EXECUTIVE DEPARTMENT.

By authority vested in me, and in accordance with section 8785 of the Revised Statues of 1889, I, William J. Stone, Governor of Missouri, having approved of the following quarantine regulations adopted by the State Board of Agriculture for the purpose of preventing the spread of contagious disease among cattle, do hereby promulgate same, and order that the same be observed and enforced throughout the State.

The following quarantine line has been defined and established, to wit:

All that country lying east and south of a line commencing at the extreme western point of the county of Contra Costa, State of California; thence in an easterly direction along the northern boundaries of Contra Costa and San Joaquin counties to the western boundary of Amador county; thence north along the western boundary of Amador county to the southwestern corner of Eldorado county; thence east along the southern boundary of Eldorado county to the boundary line of the State of California; thence southeasterly along the eastern boundary of California to the western boundary of Arizona; thence south along the western boundary of Arizona to the southwestern corner of Arizona; thence easterly along the southern boundaries of Arizona and New Mexico to the Rio Grande river; thence southeasterly along the Rio Grande river to the southwestern corner of the county of Foley, State of Texas, continuing along the Rio Grande river in a northeasternly direction to the southwestern corner of the county of Pecos; thence following the western boundary of Pecos county to the southeast corner of Reeves county; thence following the boundary line between the counties of Pecos and

Reeves to the Pecos river; thence southeasterly, following the said Pecos river to the northwest corner of Crockett county; thence easterly along the northern boundaries of Crockett and Schleicher counties to the southeastern corner of Irion county; thence northerly along the eastern boundary of Irion county to the northeast corner of said county; thence northerly to the southern boundary of Coke county; thence westerly to the southwestern corner of Coke county; thence northerly along the western boundary of Coke county to the southern boundary of Mitchell county; thence easterly to the southeastern corner of Mitchell county; thence northerly along the western boundary of Nolan county to the northwest corner of Nolan county; thence easterly along the northern boundary of said county to the southwestern corner of Jones county; thence northerly along the western boundary of Jones county to the southern boundary of Stonewall county; thence easterly along the northern boundaries of Jones and Shackelford counties to the southwestern corner of Throckmorton county; thence northerly along the western boundaries of Throckmorton, Baylor and Wilbarger counties to the Red river; continuing along the Red river in a southeasterly direction to the southeast corner of the county of Greer, territory of Oklahoma; thence northerly following the the course of the North fork of the Red river to its intersection with the southern boundary line of Roger Mills county; thence easterly along the southern boundary of Roger Mills and Washita counties to the southeastern corner of Washita county; thence northerly along the eastern boundary of Washita county to the northeast corner of said county; continuing in a northerly direction along the eastern boundary of the county of G to the southwestern corner of the county of Blaine; thence easterly along the southern boundary of Blaine county to the southeast corner of said county; thence north on the eastern boundary of said county to the northwest corner of Canadian county; thence east on the northern boundary of said county to the northeast corner of said county; thence north along the eastern boundary of Kingfisher county to the northeastern corner of said county; thence east along the southern boundary of O county to the southeast corner of said county; thence north along the eastern boundary of O county to the northeast corner of said county; thence east along the southern boundary of K county to the west line of the Ponca Indian reservation; thence north on the west line of said reservation to the northwest corner of said reservation; thence east along the northern boundary of the Ponca reservation to the Arkansas river; thence in a northerly direction, following the course of said river to its intersection with the 37th parallel of north latitude at the southern boundary line of Kansas; thence east along the southern boundary of the State of Kansas to the southwest corner of Cherokee county, State of Kansas; thence northerly along the western boundary of the county of Cherokee to the northwest corner of said county; thence easterly along the northern boundary of said county to the State of Missouri; thence southerly along the western boundary of the State of Missouri to the southwest corner of McDonald county, State of Missouri; thence southerly along the western boundary of the State of Arkansas to the southwestern corner of Washington county, State of Arkansas; thence easterly along the southern boundaries of the counties of Washington, Madison, Newton, Searcy and Stone, to the western boundary of Independence county; thence southerly along the western boundary of Independence county to the southwest corner of Independence county; thence easterly along the southern boundary of Independence county to the southeast corner of Independence county; thence northerly along the eastern boundary of said county to the northeast corner of said county; thence easterly along the southern boundary of Lawrence county to the southeast corner of said county; thence northerly along

the eastern boundary of said county to the southwestern corner of Greene county; thence easterly along the southern boundary of Greene county to the southern boundary of the State of Missouri, and along said southern boundary of the State of Missouri to the Mississippi river; thence southerly along the Mississippi river to the northwestern corner of the county of Shelby, State of Tennessee; thence along the northern boundary of the county of Shelby to the northeast corner of said county; thence northerly along the western boundary of Fayette county to the northwest corner of Fayette county; thence easterly along the northern boundary of Fayette county to the northeast corner of said county; thence northerly along the western boundary of Hardeman county to the northwest corner of said county; thence easterly along the southern boundary of Haywood county to the southeast corner of said county; thence northerly along the eastern boundary of Haywood county to the northeast corner of said county; thence in a northeasterly direction along the western boundary of Madison county to the northwestern corner of said county; thence easterly along the northern boundary of said county to the northeast corner of said county; thence northerly along the western boundary of Henderson county to the northwest corner of said county; thence easterly along the northern boundary of said county to the northeast corner of said county; thence northerly along the western boundary of Decatur county to the northwest corner of said county; thence easterly along the northern boundary of said county to the Tennessee river; thence following the Tennessee river in a southerly direction to the southwest corner of the county of Perry; thence east along the southern boundary of Perry county to the southeast corner of said county; thence easterly along the northern boundary of Wayne county to the northeastern corner of said county; thence southerly along the eastern boundary of Wayne county to the boundary line of the State of Tennessee; thence easterly along the southern boundary of the State of Tennessee to the western boundary of the state of North Carolina; thence along the southern boundaries of the counties of Cherokee, Clay, Macon, Jackson and Transylvania, State of North Carolina, to the southeast corner of the county of Transylvania; thence northwesterly along the eastern boundary of Transylvania county to the southwest corner of the county of Buncombe; thence in a northeasterly direction, following the Blue Ridge mountains, to the southwestern corner of the county of Amherst, State of Virginia; thence southeasterly along the southern boundary of the county of Amherst to the western boundary of the county of Appomattox; thence in a northeasterly direction along the western boundaries of the counties of Appomattox, Buckingham, Fluvanna and Louisa, to the southern boundary of the county of Orange; thence easterly along the southern boundary of the county of Orange to the western boundary of the county of Spottsylvania; thence in a southeasterly direction along the western boundaries of the counties of Spottsylvania and Caroline to the northwestern corner of King William county; thence in a northeasterly direction along the southern boundary of the county of Caroline to the eastern boundary of said county; thence southerly along the eastern boundary of King and Queen county to the southwest corner of Essex county; thence along the southern boundaries of Essex and Richmond counties to the southeast corner of Richmond county; thence northerly along the eastern boundary of said county to the northeast corner of Northumberland county; thence in a northeasterly direction along the northern boundary of said county to the Potomac river; thence following the Potomac river southerly to the Chesapeake bay; thence easterly along the southern boundary of the State of Maryland to the Atlantic ocean.

First—From March 10 to the first of December, 1895, each car carrying cattle in course of transportation from south and east of said line and within said area, into or through the State of Missouri, shall bear a placard setting forth plainly and in large letters that said car contains southern cattle, and each way-bill of each shipment shall have a note upon its face with a similar statement. And when said cattle shall be unloaded north or west of the above described line to be fed or watered, the places occupied by the animals shall be considered infectious grounds, subject to quarantine, and shall be immediately set apart by the owner or lessees of the property for the accommodation of infectious southern cattle; no other cattle shall be admitted thereto.

At points of destination said cattle shall also be placed in separate southern cattle pens, as prescribed in section fourth of these regulations.

Second—Whenever any cattle that have come from said area shall be reshipped from any of the points at which they have been unloaded to other points of destination, the car carrying said animals shall also bear a placard stating that said car contains southern cattle, and each of the way-bills of said shipment shall have a note upon its face with a similar statement. At whatever point in Missouri these cattle are unloaded, they also shall be placed in separate southern cattle pens, to which no other cattle shall be admitted.

Third—Cattle from the above described area shall not be transferred on foot into or through the State of Missouri from March 10, 1895, to December 1, 1895.

Fourth—All the public railroads or other stock-yards, which shall keep or receive southern cattle for trade or transit within Missouri, shall provide for use, between March 10 and the first of December, 1895, a sufficient number of pens to be used exclusively during that period for the accommodation of cattle coming from within the territory above described. Such pens shall be marked or designated by reasonably large signs, conspicuously posted, and bearing in plain and large letters the words "Southern cattle pens." And all public stock-yards shall, before April 1, next, file with the State Veterinarian an affidavit, setting forth clearly that they have complied individually with this section of the rules and regulations.

Fifth—Cattle coming into Missouri from territory within the above described boundaries shall not, during the period aforesaid, be kept, grazed or watered on public ranges, unfenced lands, highways, State lands, or within the corporate limits of any town or city within the State of Missouri, unless quarantined in accordance with article 3, chapter 167, Revised Statutes 1889.

Sixth—The State Veterinarian and inspectors shall, as far as practicable, cooperate with the United States Department of Agriculture in the enforcement of the regulations prescribed in its circular letter of February 5, 1895, addressed "To the managers and agents of railroads and transportation companies of the United States, stockmen and others," the object of which is to prevent the spread of Texas fever, in which the following directions for disinfection are set forth:

The cars used to transport such animals, and the pens in which they are fed and watered, and the pens set apart for their reception at points of destination, shall be disinfected in the following manner: (*a*) Remove all litter and manure. This litter and manure may be disinfected by mixing it with lime, diluted sulphuric acid, or, if not disinfected, it may be stored where no cattle can come in contact with it until after December 1, 1895. (*b*) Wash the cars and the feeding and watering troughs with water until clean. (*c*) Saturate the walls and floors of the cars, and the fencing, troughs and chutes of the pens, with a solution made by dissolving four ounces of chloride of lime to each gallon of water, or disinfect the

cars with a jet of steam under a pressure of not less than 50 pounds to the square inch.

Seventh—The State Board of Agriculture may appoint deputies and inspectors to aid the Veterinarian in the enforcement of the above regulations, and they are hereby empowered to quarantine, under such rules as may be prescribed by the State Veterinarian, all cattle brought into the State in violation of these regulations.

Eighth—Whenever any cattle infected with or sick of Texas or splenic fever shall be found by the State Inspector or other agent acting for the State of Missouri, located in the native division of any stock-yards, pens or sheds, he (the inspector or agent) shall, to further protect the cattle interest of this State, cause said infected or sick cattle to be immediately removed from above named native division, and the same placed in southern division of said yards, pens or sheds.

Ninth—Any and all railroad or other companies or corporations of transportation shall, at their own expense, upon the demand of shipper or shippers of fancy or neat cattle or of any breeder of fine cattle, cause any and all cars or other conveyance of transportation, which are to be used between March 10, 1895, and December 1, 1895, by said shipper or breeder, to be thoroughly cleansed and disinfected according to prescribed method hereinabove mentioned.

NOTE—These regulations are adopted by authority of section 8785, Revised Statutes of Missouri, 1889, and, if approved by the Governor, the same section provides a penalty for violation, of a fine of not less than $1,000 nor more than $10,000 for each and every offense, to be recovered in any county into or through which such stock is brought.

Sheriffs and constables in Missouri are hereby directed to enforce these regulations, and to arrest any and all parties who may be guilty of violation thereof.

In testimony whereof, I hereunto set my hand and cause to be affixed the Great Seal of the State of Missouri. Done at the City of Jefferson, this 6th day of March, A. D. 1895. WM. J. STONE.

By the Governor:

[SEAL.] A. A. LESUEUR, Secretary of State.

OFFICIAL WORK OF DR. T. J. TURNER, OF COLUMBIA.

Expenses not including Salary for 1895.

Date.	How called.	Kind of stock.	Owner.	Location.	Disease.	How disposed of.	Expense.
Jan. 2	.....	.....	.....	Jefferson City	.....	.....	$8 90
11	Letter	Horse	L. Lamb	Washburn	Glanders	Quarantined.	36 70
22	Petition	"	John Slife	Gravel Point	Nasal catarrh	Prescribed	
23	"	"	A. J. Fender	Brighton	Influenza	"	49 85
25	.....	"	.....	Brunswick	Glanders	Destroyed	
Feb. 6	Gov. Stone	.....	.....	Jefferson City	.....	.....	7 20
12-19	"	.....	.....	Jasper & Newton Co.	Quarantine of	.....	65 30
15	Petition	Horses	Miller Bros	Neosho	.....	Quarantined.	.....
27	"	"	Nancy McNul	Odessa	Influenza	Prescribed	8 55
Mch. 1	.....	Horse	.....	Marshall	Nasal polypus	.....	
6	Petition	Cattle	M. Sleyster	Dalton	Corn-stalk disease.	Prescribed	21 10
7	.....	.....	.....	Jefferson City	.....	.....	
13-16	.....	.....	.....	"	.....	.....	40 25
17	Petition	Horse	J. Wethers	Spurgeon	.....	.....	
Apr. 11-13	.....	.....	.....	Kansas City	.....	.....	14 00
17-18	Letter	Horse	Wm. McFall	Pattonsburg	Nasal abscess	.....	13 50
May 7	Petition	"	Geo. Ham	Milan	Mal-treatment	.....	16 25
28, June 1	Secretary	.....	.....	Stone	.....	.....	43 65
June 3	Letter	Horse	A. T. Duneway	Petersburg	Loco-motor ataxia.	Prescribed	
6-7	Petition	"	Monroe Dale	Dockery	Glanders	.....	.....
14	"	"	J. H. Harris	Mansfield	Frontal abscess	Trephined	
17	"	Hogs	Edmonston	Mexico	Hog cholera	.....	19 55
18	.....	Horses	Chilton	Piedmont	Influenza	.....	
21	Petition	Horse	F. D. Kemper	Troy	Pneumonia	.....	
25	"	"	Bender Mann	Stockton	Glanders	Quarantined	39 81
26	.....	"	N. Allen	Springfield	"	"	
July 2	Petition	"	L. E. Mitchell	Dameron	Distemper	.....	
5	.....	"	Solon Smith	Fayette	Tumor	.....	
6	Petition	"	H. T. Barnett	Sedalia	Nasal gleet	.....	33 70
7	Letter	"	F. L. Stephens	Fort Lyon	No disease	.....	
8	Petition	"	J. I. Brooks	Rich Hill	"	.....	
16	Letter	Cattle	C. C. McLemore	S. Greenfield	Texas fever	Quarantined	22 00
17	Petition	Horse	Earl Corwine	Adrian	Decayed tooth	Adv. removal	

25	"	Steer	Erwin Page	Bourbon	Big jaw		20 45
25	"	Horse	Erwin Page	"	Nasal gleet		
Aug. 3	"	"	C. E. Blair	Alexandria	Broken nose		26 75
4	"	Cattle	R. McClintock	Greenfield	Dead		
7	Telegram	Horse	S. H Lewis	Kearney	Glanders	Quarantined	18 55
12-15				St. Louis			12 55
18-20	Secretary	Cattle	Winkemeyer	"	Texas fever		12 75
23-24	Petition	Mules, hogs & cows	Jerry Deskin	Moberly	Anthrax	Vaccinated	25 90
26	Letter	Horses	S. H. Lewis	Kearney			
31		Cattle	B. Leurbke	St. Louis	No disease		12 05
Sept. 7	Letter	Horse	L. S. Curry	Marceline	Glanders		12 65
10	Telegram	Cattle	Hammett	Huntsville	Corn stalk		23 00
14	Petition	Horse	C. Darling	Craig	Glanders	Quarantined	
19	"	"	Frank Campbell	Troy	Injured nose		12 65
Oct. 4	"	"	H. Stunke	Craig	Nasal catarrh		21 65
9-12	Petition	Hogs	Grounds and others	Union Star	Cholera		
9-12	"	"	Graff & Watts	Rosendale	Cholera		21 15
23	"	Horses	Wm. Brown	Glasgow	Malig. strangles		10 20
Nov. 9		Horse	C. Ellington	Paradise	Glanders	Quarantined	8 40
14	Telegram			Windsor		Destroyed	6 00
24		Horse	Wm. P. Lynn	Armstrong	Catarrh		2 75
Dec. 9		Horses	C. Ellington	Paradise		Released	20 10
14	Telegram	"	Chas. Weihl	Kansas City	Farcy	Quarantined	
14	"	"	J. L. Hickman	"			
19	Petition	"	W. L. Johnson	"			15 05
13	Letter			King City			
18-20				"			15 05
26	Petition	Horses	L. A Miller	Stienmetz	No disease		4 60

OFFICIAL WORK OF DR. T. E. WHITE, OF SEDALIA.

Expenses including per diem for 1895.

Date.	How called.	Kind of stock.	Owner.	Location.	Disease.	How disposed of.	Expense.
Feb. 13	.....	Horse.....	J. G Burgess	Joplin	Glanders.....	Quarantined.	$37 20
13	.....	"	F. H Hansford	"	"	Order killed..	
16	Letter	Cattle.....	F. D. Hammond...	Holden	Vermin.....	Prescribed...	10 00
19	"	Horses.....	M. C. Rapier.....	Ash Grove.....	Bastard strangles..	" ...	35 70
19	"	"	O. E. Sewall.....	Cave Springs	" ..	" ...	
Apr. 15	Petition	"	E. Ayler.....	Elm..	" ..	" ...	13 70
May 17	Letter	"	E. R. Mickelberry..	Leesville.....	Distemper.....	Dead	11 70
18	"	"	S. Walker.....	Clinton	Decayed molar....	Prescribed...	11 70
18	"	"	A. J. Duneway...	Petersburg.....	Bastard strangles..	" ...	
Aug 5	Veterinarian.	Cattle.....	.....	Beaman.....	.....	.....	9 00
30	Telegram ...	"	.....	Sheldon.....	No disease.....	Quarantined.	24 30
S pt. 11	" ...	"	J. R Thomas.....	Mt. Leonard.....	Texas fever.....	.....	13 60
3	Petition.....	Horses.....	Noah Henly.....	Sprague.....	Dead.....	.....	25 60
27	"	Cattle.....	Pat Sullivan.....	Dumpville..	Dry murrain.....	.....	9 50
Oct. 16–18	"	Horse.....	J. Henderson.....	Stockton.....	Nasal gleet	Prescribed...	35 20
21	"	Hogs	Reed and others ...	Simco.....	Cholera.....	.....	39 95
22	Letter.....	Horses.	.....	Rich Hill	Dead.....	.....	

OFFICIAL WORK OF DR. JOHN S. MEYER, OF ST. JOSEPH.

Expenses including per diem for 1895.

Date.	How called.	Kind of stock.	Owner.	Location.	Disease.	How disposed of.	Expense.
Jan. 6-7	Letter	Horse	John Young	Corning	Abscess	Lanced	$19 55
8-9	Secretary			Chillicothe			22 45
22-25	Veterinarian			Jefferson City			18 00
Feb. 13-14	Letter	Horses	John Young	Corning	Strangles		19 75
19-20	Petition	"	Pierce & Wise	Craig	Glanders	Quarantined	19 45
25		Horse	John Shipley	St. Joseph	"	"	5 50
July 7		"	J. Y. Haley	"	"	"	6 00
31		"	King	"	"	"	6 00
Aug. 5		"	Ike Stone	"	"	"	
31		"	John Foster	"	"	"	10 50

OFFICIAL WORK OF DR. H. B. ADAIR, OF KANSAS CITY.

Expenses including per diem for 1895.

Jan. 24	Petition	Horse	J. L. Thompson	Dockery	Abscess		$12 26
Feb. 15	Letter	Horses	J. D. Cusenberry	Fairmount Park	Glanders	Quarantined	12 00
18	Petition		Smith	Liberty			
May 23	Letter	Horse	A. L. Collins	Kansas City	Glanders	Quarantined	3 50
June 6	"	"	F. Menown	"	"	"	3 50
Oct. 3	"	"	A. L. Collins	"	"	"	

OFFICIAL WORK OF DR. JESSE ROBARDS, KIRKSVILLE.

Expenses including per diem for 1895.

Sep. 20	Veterinarian	Cattle	Meeks & Hamilton	Kirksville	No disease		$7 00
Nov. 4	Petition	Horses		Willmathville	Distemper		9 50

CATTLE INSPECTORS.

Name.	Location.	Total number inspected.	Total salary and expenses.
G. H. Boughner.....	St. Louis.....	94,328	$250 00
Joseph Bruser.....	Kansas City.	137,715	200 00
*J. S. Meyer.....	St. Joseph.....	.....	350 00
*F. W. O'Brien.....	Hannibal	.....	120 16
†D. F. Luckey	Jasper & Newton counties	2,477	926 73

*No sale yards at Hannibal and St. Joseph. Inspectors at these places looked after the disinfection of pens and cars.

†In the early part of the season cattle from these counties were permitted out in co-operation with the Government inspector, and not included in this report.

FARMERS' INSTITUTE PAPERS.

BUILDING UP MISSOURI FARMS.

By T. B. Terry.

There is a farm over every farm and a farm under every farm. The man who farms the middle farm only will, in time, exhaust its fertility and gradually become poorer and poorer. The most successful man will utilize all three farms. Our fathers, as a rule, did little more than farm the surface soil, and gradually the available fertility in it has become exhausted. This was the kind of farming usually done during the first 50 years or so of the settlement of all our land. Some land, however, is so rich naturally that even this great drain scarcely tells on it, but on other soils not so fertile, after 50 years of ordinary cropping, they cease to yield a renumerative crop, unless different methods are followed. Thousands and thousands of farmers are confronting this situation today.

Three elements are needed to furnish plant food to bring up these farms. They are nitrogen, phosphoric acid and potash. The first is the most costly by far. In commercial fertilizers you pay some 15 to 18 cents a pound for this, while the phosphoric acid and potash cost only about one-third as much. Now, in 50 years of cropping with ordinary farm crops, such as corn, wheat and timothy, on good soil, the crops produced have taken from your land something like $500 worth of this plant food per acre. Some of this is returned, of course, in the manure, but on many farms but a very small part has gotten back to the farm, as a whole. Think of the tremendous drain of fertility! Is it any wonder that the yield of land is gradually decreasing? Of course men might have farmed so as to have kept a large part of this fertility on the land, but comparatively few have. Most of the first farming in this country was exceedingly exhaustive.

In many parts of Missouri the farmers are now facing this condition of diminishing fertility, and realize the situation, and are ready to take hold somewhat of the remedy. In some parts they are not. The

soil is still too rich and productive. As Hon. N. F. Murray said of one section last fall, they will have to exhaust their land more before they will be ready to pay any attention to better methods. It is too bad that it is so, but so it has always been. It would be far better to keep up this magnificent rich soil, but the average man seems to wish to get all he can out of the land, and is not half as anxious about keeping up its fertility.

Let us look briefly at some of the ways in which one can keep up the fertility of the farm: First, it makes a good deal of difference what we sell off. Uncle John Patterson, whom everyone knows, sells butter. He keeps cows, largely, and feeds his farm crops mostly to them. He gets 25 cents, at least, for his butter the year around. In selling a ton of butter for $500, he does not remove from the farm but 48 cents worth of plant food. If he sold $500 worth of timothy hay at $5 a ton, he could not replace the plant food sold off in fertilizers for less than about $548. You see, it makes a tremendous difference what we sell off the farm. In selling off $500 worth of fat steers, at say four cents a pound, you would only remove from the farm in the steers sold about $70 worth of fertility.

Feeding out the corn and hay to steers, cows or other stock will remove less from the farm, but unless we exercise some care in feeding so as to save the manure, it won't make much difference. The time has come when we must save the manure carefully. You cannot buy the plant food in a ton of good stable manure, liquid and solid all saved from well fed stock, for less than about $2.50. The liquid is worth as much as the solid or more. Uncle John Patterson can keep the fertility of his farm up if he has cement floors under the stables, to hold every drop of the manure from waste, and then gets into his land without loss from leaching and heating. If you keep stock on the fields the manure is not really lost, much of it, but it often is not evenly and properly distributed. Feeding in yards on side hills where the manure will leach and wash away and waste, is little better than selling the feed right off the farm. These practices will be gradually improved on in the future, because farmers will be driven to better methods. They will have to save plant food or see their farms run down so the crops do not pay any longer.

But now, what about that farm over the surface farm? I mean the air. Eighty per cent of this is nitrogen, and that is the most costly kind of plant food, as I have told you. But you can grow corn, wheat, timothy, etc., for all time, or until they will not grow any longer, and they cannot get any of the nitrogen out of the air. They were not so made that they can. But grow the red clovers, and they can feed on this

nitrogen and use it to make their growth. Then following, corn and wheat, etc., can get it. All the nitrogen that you may want in the future can be obtained in this way for nothing. Grow clover in regular rotation, once in three to five years, and get this nitrogen free. It is the only practical way to get it for many. You can never afford to buy it in fertilizers with farm crops at present prices. And why buy it when you can get it for nothing?

Now, the farm below. In some parts of Missouri you will have to tile-drain the land before you can make the most of the farm below. And it is better to do this where needed than to buy another surface farm. In many cases the gradual deepening of the soil will help. You bring more of the subsoil up, little by little, to the action of the air, sun and frost, and thus liberate more plant food. And then if the land is well drained naturally, or with tiles, the red clover roots will go down and pump up much phosphoric acid and potash that your corn, wheat, etc., could not get, and after growing the clover it will be available, as it is up in the large top roots and in the tops of the clover plants. It is an actual fact that clover can bring up this lower farm to the surface one. The Missouri farmer, as a rule, can get the nitrogen from the air and the phosphoric acid and potash from the subsoil in the proportion that he needs for growing as large crops of corn and wheat on his land as can be grown.

I know this sounds like a fairy tale, but it is true all the same. Truth is often more wonderful than fiction. From a scientific standpoint it is correct, and also from a practical one. Twenty-six years ago we moved on to a farm that had been run down as so many have. It would not produce more than six or eight bushels of wheat per acre, and other crops in proportion. We have brought it up by working just in the line indicated above. First, there is no waste of manure. We have cement floors in stables and all stock are kept there during the feeding season; then we tiled what land needed it; then clover has been grown in a regular rotation to get us fertility from the farm below and the one above, and it has done it. Before a dozen years had passed the farm brought us 35 bushels of wheat per acre. In 1894 it reached its highest, 47¼ bushels per acre on all the land sown, and, of course, other crops have been in proportion. Is not this about as much wheat as could stand on the land?

And then this fertility to bring up the farm had really cost us less than nothing, as we have had more hay to the acre than timothy would have yielded, and when cut in blossom it is worth more to feed out.

A previous owner of our farm gradually exhausted its fertility, farming only the surface farm about four inches or so deep at that.

And he grew poorer and poorer. We took this same farm when run down, and gradually deepening the soil, we built it up until today it is able to grow a large crop, and meanwhile we have made it pay for itself and bring us many thousands of dollars besides, but we have drawn freely on the rich farm above and the other below, as well as following good business methods in the way of saving all manure, good tillage, etc. And it should be said that we began in debt for the farm, about all it was worth. We had to work up from the very bottom.

Now, friends, I hope many of you will be set to thinking by these simple facts. Where there is a will there is a way. You can build up your farm, or you can keep it up, which is better. The process is a slow one, but it is sure. We used the common red clover. Some use the mammoth. In Southern Missouri, I feel quite sure crimson clover can be made to do a great work in renovating the land. Cow-peas can also be used in the southern part of the State. All these have the ability of feeding on the farm above, and more or less on the one below. For years I have been preaching rotation of crops and clover to you, my friends, at your Institutes. I fully believe in all I have said. I know what I am talking about from long experience. But for the fact that I had succeeded on our farm, I never would have been asked to come and try to help you. I have tried hard and earnestly to do you some real good. I hope very many will give this matter their earnest attention. If you do not now, sooner or later you will have to. The sooner you take hold of improved methods the better for you. Of course many do not need this advice, but I fear there are very many who do.

DEVELOPMENT OF TRAITS IN DOMESTIC ANIMALS.

By Col. G. W. Waters.

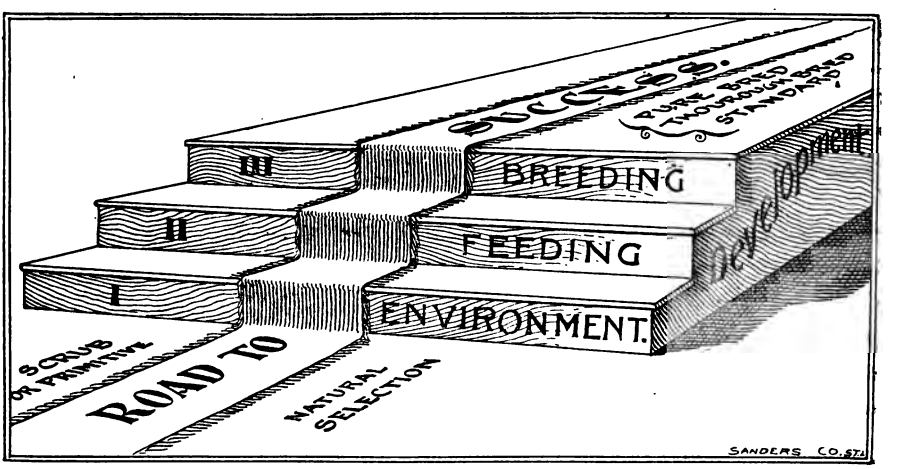
Development of traits in stock-breeding may be representated by a figure with three steps indicating three classes of influences. These three influences must work in together for the best results.

To these three conditions and to the related forces dependent upon them may be referred all the various developments observed.

The diagrams or charts given and the subdivisions embraced, are intended to be something of an index to the subjects that would naturally come up for discussion. We cannot enter into details in this brief paper.

OUTLINE.

I. Environment.		Climate.		
		Pasture.	Sunlight. Exercise.	
		Shelter.		
		Training.	Habits formed. Instinct.	
		Sanitation.		
II. Feeding.	Nutrition.	Quantity.	Early maturity. Size, growth.	
		Quality.	Fat, heat. Muscle-bone. Milk-fœtus.	
		Palatability.		
		Digestibility.		
III. Breeding.		Scrub or primitive. "Natural selection."	"Survival of fittest."	
		Pedigree.	Thouroughbred. Pure bred. Standard.	Selection of fittest for man's use.
		Harmony of blood.	Line breeding. In and inbreeding Correlation.	Prepotency. Fixation of type.
		Cross-bred.	Variability. Broken unity. Not a blend.	
		Variation.		



It may be noted that it requires as much skill and care on the part of a stock-raiser to take animals of high breeding and superb development and perpetuate these qualities as was exercised by the breeder to bring them to their high standard. Any reasonable modification or change in the characteristics, either in the direction of a better type or otherwise, may be eventually transmitted to posterity by heredity.

Hence, any good traits that have been developed may be lost if the condition that produced the same are wanting. In view of these principles it becomes a pertinent inquiry to ascertain what influences may be exerted by these several conditions.

ENVIRONMENT.

That climatic conditions have much influence in development of domestic animals we are assured. That the climate of Missouri is well suited to the highest types is evidenced by the fact that our herds and flocks have won distinction in a great number of contests in the showring, notably at the World's Fair. An ideal environment, one conforming to all requirements, is found in our blue-grass and clover pastures, fresh air, exercise, sunlight and succulent food. But the best climate needs tempering, its extremes modified, hence barns become a necessity. It should be borne in mind that confinement of animals in barns is abnormal. In this construction and equipment care should be taken to violate as few of the natural conditions as possible.

Sunlight.—The value of sunlight in promoting health and vigor is too well known to need extended notice. Yet there is much less regard paid to this principle in barn construction than should be. A number of experiments are reported, indicating a very much better growth of animals, especially pigs and lambs, when kept in well-ventilated and well-lighted barns than when kept in dark quarters. Dr. Miles quotes a bit of history: At Lille, in France, several families occupied very dark quarters under the Government fortifications. In a few generations the children reared in these places were a race of cripples and imbeciles. There was a want of vigor and development. It is a well-known principle that diseases are more readily propagated in such quarters. Tuberculosis is much more abundant among the dairy cows of the cities. It is practically unknown in the herds on the open range.

Training.—Traits in animals developed by training such as speed in horses, flow of milk for a long period in milch cows, docility, may be transmitted to posterity. Leaving off these trainings would soon result in lessening these traits. A gentleman in the East owned a stud of thoroughbreds. They were trained upon the turf and were winners at the races. He, after a time, abandoned the track, but kept his horses. After a few years of non-use they were sold at a dispersion sale. It was painfully apparent that they had lost their high character for speed. Training has a value among all of our domestic animals. Instincts of wildness and viciousness may be overcome and docility developed. Contentment will follow a trait of much value, for a wild

or vicious or discontented animal is not a desirable one. The training becomes habit, and habit long fixed becomes hereditary. Instinct is but a transmission of fixed habit, entailed by long continued environment of ancestry: *e g.*, the sheep of our farms that have never been handled by shepherd dogs, when danger approaches instinctively run and scatter, whereas the sheep from the West, New Mexico, Montana, when danger appears will form a close cluster, their faces turned to the danger. This they will do for succeeding generations, even if the training has been omitted for a time, this particular instinct will be lost only after the habits have been changed for a considerable period of time.

FEEDING.

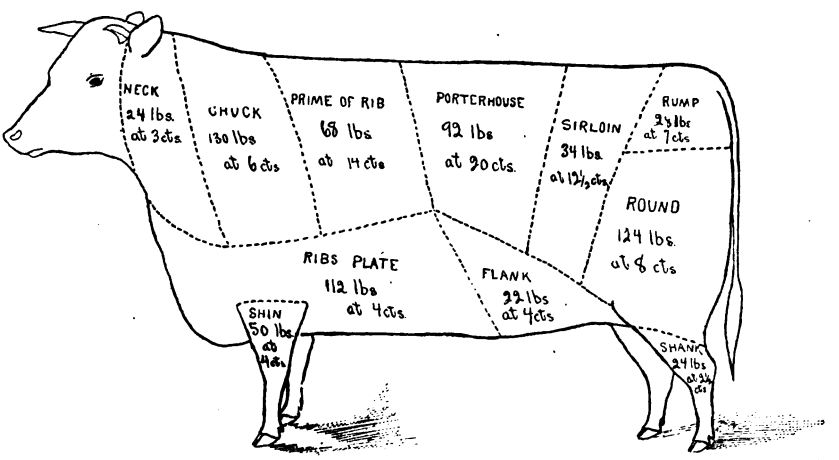
It is through nutrition that all growth and development of the physical organization must come. The animal is a machine. One of the prime considerations in determining the value of any machine is its capacity for work or rapidity with which it can perform a given duty. Hence, it is important to develop capacity in this direction, in other words, to secure early maturity. Quantity of feed has a direct relation to this trait. The animal machinery in which this trait has not been developed is unable to manufacture out of the materials of the field, such as grass and grain, the products for the market, such as meat, milk, etc., with desired rapidity. To illustrate: a litter of pigs of the improved breeds would be competent to make 300 pounds of pork each in 10 months, while a litter of native razor-backs would be unequal to the task, no matter how carefully handled or abundantly fed. Abundant feed hastens development and begets in some measure the trait of early maturity, the ability to manufacture more rapidly. This trait like others is transmissible.

Quality of Feed.—Different feeds have different properties. Some are productive largely of fat and heat, others are more suited to the development of muscle, milk and wool, others of bone. Hence, for the perfect development of the animal body, variety is needful. Numerous experiments tried, point out quite clearly the varying effects on the animal economy of different feeds. Prof. Sanborn, of Missouri Experiment Station, Prof. Henry, of Wisconsin, and others have given results of such trials, and all concur in general, in showing that such feeds as clover, wheat bran, oil cake, peas, etc., develop muscle, give a greater supply of blood, larger heart and liver and a superior development in the entire animal economy as compared with the fat-producing foods, such as corn, timothy, hay, etc. Prof. Henry tested the effect of some of the bone-producing materials, such as wood ashes, ground limestone, and by their use the strength of bones of pigs was increased over 100

per cent. By the addition of wood ashes and salt to a corn ration it took 50 pounds less corn to make 100 pounds of pork than where they were not used. It is clearly within the province of the breeder to modify the development of his animals by choice of feeds. The early maturing, quick fattening swine of today are the result of methods of feeding, as well as of selection, breeding and management. But an excessive development of one trait is at the expense of others. So when the excessive fat-producing trait is unduly developed vitality is impaired. I have only endeavored to point out a very few of the important things to be considered in the difficult task of live-stock improvement. These are of first consideration, and are the necessary steps to successful breeding, a subject to be considered after these steps are taken.

SELECTING AND BREEDING CATTLE FOR FATTENING.

By Dr. F. B. Mumford, Missouri Agricultural College.



The carcass of a well-fattened grade steer as cut up by the Chicago butchers, giving retail price per pound for the different cuts. A good 1200 pound steer dresses about 800 pounds, and of this 708 pounds is marketable meat. Notice that all the best cuts are taken from ribs, loin and hindquarters. These valuable cuts together weigh 346 pounds, and at above prices sell for $44.55. The less valuable cuts from the forequarters, belly and flank, weigh 362 pounds, and bring only $16.48.

The above illustration was prepared for the students of the Missouri Agricultural College for the purpose of aiding them in the study of beef cattle from the standpoint of the consumer and the butcher, but more particularly from the standpoint of the feeder and breeder. It is primarily intended to show how a beef carcass is cut up by the retail butcher, and also gives the trade name of the various butchers' cuts. An interesting point brought out by this illustration is the relative

weight of the various cuts. The chuck, for example, is the largest cut secured from the carcass, closely followed in gross weights by the round and ribs plate. The lightest cuts are the flank, neck, shank, rump and sirloin, increasing in weight in the order named. The prices received for the various cuts is another point that is very suggestive to those engaged in handling beef cattle, whether feeders, breeders or drovers.

In the first place, let us consider the illustration from the standpoint of the feeder. In these days of close competition, low prices and small profits, a seemingly small item in the process of manufacture may measure the difference between a considerable profit or a distinct loss. From the farmer's standpoint a fat steer is a manufactured article representing in his makeup raw materials in the form of food, skilled labor applied by the farmer in breeding and feeding and money invested. Like all other manufacturers, the farmer aims to produce what the market demands from the materials employed, and to produce the article in demand at the least possible expenditure of time, material and money. Considering then the fat steer as a manufactured product, how can we reduce the cost of production, or that which amounts to the same thing, produce a more valuable carcass at the same expense? There are at least two methods of making the feeding of beef animals more profitable: first, by reducing the cost of production, and second, by feeding better steers. The first method seems to have been so thoroughly considered that in this country of cheap corn and wide range the cost of fattening steers has been reduced to the minimum. The second method, we believe, offers a wide field for improvement in increasing our profit from feeding steers. The question naturally arises what kind of steers shall we feed? What shall be the basis of our selection? If we divide the available supply of steers for fattening into two groups, viz.: grades—meaning those containing more or less of the blood of some improved breed like the Shorthorn, Aberdeen Angus or Hereford, and natives or scrubs, meaning the common stock of the country having no indication of any infusion of blood from the recognized breeds above mentioned, then the answer will be easy. Every experienced breeder will, other things being equal, select the grade.

Why is a grade Shorthorn, Angus, Hereford or other improved beef breeds better to feed than a scrub or native? Right at this point the writer believes there is some misconception, many believing that a grade is superior because of his ability to make a greater gain than the native on the same food. Careful experiment has shown that this is

not necessarily true, and that under similar conditions, a scrub may produce a pound of gain at no greater cost than a grade. As evidence of this fact, let is consider the experiments along this line from the Missouri and Kansas Experiment Stations. At the Missouri Station in a test (Bulletin 24) with 20 steers, consisting of pure-bred Shorthorns, Aberdeen Angus and Herefords, scrubs and grades, the cost of producing a pound of gain in each case is given in the following table:

Scrubs	cost 6.01 cents	to produce	1 pound	gain.
Angus	" 6.12	"	"	"
Grade	" 6.64	"	"	"
Shorthorn	" 6.79	"	"	"
Herefords	" 7.17	"	"	"

The above table is based upon a trial extending over two years, beginning with steers about six months of age. It will be seen that the scrub produced a pound of gain cheaper than any other class of animals in the test, or, in other words, required less food to produce the same amount of gain. At the Kansas Station (Bulletin 51) in a comparative test with Shorthorns and scrubs, the cost of producing a pound of gain with scrubs was 8.49 cents and with Shorthorns 8.30 cents, showing a slight advantage for the Shorthorns. The trial lasted for 161 days, from November to April.

The above results must in no sense be taken to mean that the scrub is a more profitable feeder than the pure-bred or grade, but it does show conclusively that the superiority of well-bred steers does not lie in their ability to produce more gain on a given amount of food. We must look for the superior excellence of a grade steer for fattening purposes in his earlier maturity—eating more and gaining more in the same time—and his increased value when fattened. The fattened grade is more valuable than the fattened scrub, because his carcass has a larger per cent of valuable meat cuts and consequently a smaller proportion of the inferior cuts.

The diagram at the beginning of this article is intended to represent a good grade 1200 pound steer. A steer of this kind will dress about 800 pounds and furnish 708 pounds of marketable meat. A careful examination of the above diagram will show that of the above marketable meat 362 pounds, including the neck, chuck, ribs plate, flank, shin and shank, brings in this case $16.48. The remaining 346 pounds, including all the choice meat cuts—the ribs, porterhouse, sirloin, rump and round retail for $44.55, or, to state it differently, less than half the total weight of saleable meat brings nearly three times as much money as the remainder. But this difference is less marked in

the diagram presented above, because this illustration represents the carcass of a good grade steer. The carcass of a scrub would show a greatly increased proportion of the less valuable meat parts and a corresponding decrease in the best cuts. Then again the scrub steer dresses away more so that a grade of the same weight will furnish a considerable larger amount of marketable meat. The teaching of the above is plain. We must pay more attention to the selection of steers for fattening. A slight advantage in the breadth of loin of one steer over another may increase the weight of a valuable porterhouse cut, and consequently the value of the animal. Other things being equal, the best feeders are blocky and low on the legs, showing a distinct tendency to a broad loin, a straight back, long level rump, flank low down and thick, broad full thigh extending well down to hock, and all these should be associated with a mellow, velvety skin of medium thickness. Such steers are seldom found among scrubs, and we must, therefore, depend upon grades of the various pure bred forms. But let us never make the mistake of thinking that all grades possess the feeding qualities mentioned above. We must still exercise judgment in selecting steers of the desired type.

But perhaps this diagram is of even greater interest to the breeder as indicating the road to permanent and lasting success. It is a universal law of breeding that the fewer the number of qualities selected for the purpose of improvement the greater will be the success along the chosen lines. It is the aim of every breeder to excel in the direction of some valuable quality. In breeding dairy animals, the cow that can make 500 pounds of butter in a year is seldom interrogated as to whether her tongue is black or white. In the improvement of beef animals, likewise, we should pay more attention to the fundamental beef qualities, and perhaps less to the color and other fancy breed points. We must pay particular attention to the development of those parts which make the steer worth more money when fattened. There is no denying the fact that at the present time in this country the real end to be sought in breeding improved beef cattle is supplying a better grade of steers for fattening. Breeders of improved live-stock have paid too little attention to this phase of their business, and have perhaps devoted too much attention to color, shape of head and in some cases the proportion of minor parts not directly associated with beef characteristics. As a guide to the feeder and breeder we believe the following score card to be of very great value in selecting animals. This score card is used in connection with live-stock instruction at the Missouri Agricultural College. It will be noticed that this scale of points coincides very closely with what has

been said above in regard to the beef qualities of cattle. Little regard is had for those characteristics which do not directly indicate beef characteristics, or which by correlation are not intimately associated with them. On the other hand, parts which clearly indicate superior excellence in beef qualities, such for example as form, quality, ribs, loin, rump, etc., are given a much larger number of points. It will be observed that the sum of all the points on the score card just equals 100, which represents the perfect animal. In scoring an animal each point is examined and its development indicated by a number in the second column. The total of the points in second column will represent the score of the animals.

SCORE CARD A.—BEEF CATTLE.

Scale of points.	Perfect.	Stud'ts' estimate.	Corrected.
General Appearance:			
Age, estimated.....corrected.....			
Weight, estimated.....lbs.; corrected.....lbs.			
Form, square, blocky, straight top and bottom line, broad.....	8	.....	.....
Quality, hair fine, soft; skin mellow, loose, pliable and medium thickness; fine clean bone.....	8	.....	.....
Temperament, quiet.....	3	.....	.....
	19	.....	.....
Head and Neck:			
Muzzle, clean cut, fine; mouth large; lips thin; nostrils wide and open.....	2	.....	.....
Face, short, not lean.....	3	.....	.....
Eyes, full, bright, placid.....	1	.....	.....
Forehead, broad.....	1	.....	.....
Ears, medium size, fine texture, covered with fine hair	1	.....	.....
Horn, waxy; fine texture.....	1	.....	.....
Neck, thick, short, set firmly on shoulders.....	3	.....	.....
	12		
Forequarter:			
Shoulder vein, full.....	3	.....	.....
Shoulder, compact, well covered with flesh.....	3	.....	.....
Chest, full, deep; thick through the heart.....	4	.....	.....
Brisket, deep, moderately projecting; breast wide...	1	.....	.....
Legs, straight, short, wide apart, strong, clean bone, arm full.....	3	.....	.....
	14		
Body:			
Girth, large.....ft.....in.....	4	.....	.....
Crops, full.....	3	.....	.....
Ribs, well sprung, arched and deep, thick fleshed.....	5	.....	.....
Back, broad, straight, short.....	5	.....	.....
Loin, full, thick, broad.....	5	.....	.....
Flank, full, low and thick, making underline straight.	3	.....	.....
	25		
Hindquarters:			
Hips, wide apart, smooth.....	4	.....	.....
Rump, long, level, wide.....	5	.....	.....
Pin bones, not prominent, far apart.....	3	.....	.....
Tail, base smooth, bone fine and clean, hair of switch fine.....	3	.....	.....
Thigh, full, well-fleshed.....	4	.....	.....
Twist, deep.....	5	.....	.....
Purse, full.....	3	.....	.....
Legs, short, straight, fine clean bone.....	3	.....	.....
	30		
Total.....	100		

COMMERCIAL ORCHARDING.

By Hon. N. F. Murray.

Commercial orcharding in this country is a thing of recent date. In the early history of this country we were a nation of agriculturists. Only six per cent of our people lived in town and city. We had no great manufacturing centers and no railroads. Under such conditions there could be no incentive to commercial orchard growing. In fact, the man who chanced to have a few hundred bushels of apples, more than his family could use, either fed them to his hogs, let them rot, or worse yet, hauled them to the still-house to be made into apple brandy to curse the race. And the man who would then stoop to selling small fruits was too small and mean to be accorded a fair standing in good society. In fact, small fruits were looked upon as common property to which the public had a perfect right to help themselves. Twenty-five cents per bushel was considered a good price for extra summer and fall apples. In fact, the writer has bought them for half this price, and when growers got $1 per barrel for choice keeping apples, including the barrel, they felt they were getting rich fast, and said it paid better than anything else. And so it did, for I have seen 3000 barrels sold in one year from 15 acres on the Ohio river. Their success induced the planting of what was then (40 years ago) considered very large orchards from 500 up to 1500 trees. And many said it would surely be over done, and when they would come into bearing it would be impossible to sell the fruit.

But a new era dawned upon our country. Railroads began to build up and reach out over our vast country in every direction, and we now have nearly 200,000 miles, not only giving us transportation for our fruit to every town and city, but employing nearly 1,000,000 men who, together with their families, form an army of several million consumers for the product of our orchards. Our cities took on new life, and began to grow. Manufacturing centers were developed and the population of our towns and cities has increased from 6 up to 35 per cent, which added millions more to our army of consumers; and it was soon found in place of growers failing to find a market for their fruit that there was not near enough to supply the demand at greatly advanced prices. Twenty-eight years ago the writer sold Missouri apples in the East at $8 per barrel. Several years later saw them selling in Missouri orchards at one to two dollars per bushel, a single tree often bringing the owner $60 in one year. The man who had planted an orchard of

two to five acres for family use often received from $500 up to $1600 for the surplus. This stimulated larger planting, and many planted good sized orchards of from 500 up to 1500 trees 25 years ago. And many people again predicted over-production and no sale when all these orchards came into bearing.

Just at this time I handed a paper prepared by my father (an experienced fruit-grower), advising a larger planting of commercial apple orchards, to the editor of a county paper, who after looking at it, handed it back and refused to publish it on the ground that it would be very wrong to give the people such advice, and wanted to know of me what in the world we would do with the apples of all the young orchards then planted in Missouri. I told him I was sure they would all sell at paying-prices, but he could not believe they would. Time has verified my statement. Many of these orchards made their owners rich, the fruit often selling at from $50 up to $300 per acre, and the planting has been going on from year to year, and Missouri is now known far and near for the great quantity and superior quality of her fruit, which has never taken second rank when in competition with the fruit of other states. In 1890 Missouri shipped out 5,000,000 barrels of apples, for which she received $10,000,000, to say nothing of the millions of barrels consumed by her own internal markets. Not only has Missouri increased her fruit-production, but other states have done the same in apples, peaches, pears, plums, prunes, grapes and small fruits, and the aggregate sale of fruit in the United States in the last 30 years has increased from about thirty up to hundreds of millions of dollars. The American Agriculturist figures out an apple-crop in the United States for 1895 of 66,250,000 barrels, or about one barrel for each inhabitant.

Our latest reports show that we have exported nearly 1,000,000 barrels, leaving over 65,000,000 barrels for home consumption. And yet with all this enormous crop and with an abundant crop of grain and vegetables at low prices, we find apples not simply holding their own but advancing in price from 75 cents to $1 per barrel in packing season, up to two and three dollars per barrel. Does this look like over production? I ask what other product of the farm has advanced during the same period and how much? Precious little, if any. At the present time many farmers in Missouri are doing without apples, and as a State we annually pay hundreds of thousands of dollars for grapes from New York and Ohio, and peaches from Michigan, all of which we ought and can grow in our own State. We have millions of acres of cheap land, the finest in the world for fruit. In South Missouri we have a vast region admirably adapted to peaches where they seldom

ever fail; where peach yellows are unknown; where they grow the largest peaches of the finest quality, and the largest, most hardy and lasting of any on earth. The writer visited what is claimed to be the largest peach tree in the world, in Dade county, Missouri. It is 35 years old, and measures four feet in circumference, two feet above ground, and before breaking off with weight of fruit two years ago, the top measured 60 feet wide. Who can beat it? When we consider the great natural advantages of Missouri for fruit-growing, her geographical position, her cheap lands and the growing and ever increasing demand for her fruit in the vast region lying northwest and outside the fruit belt, we feel perfectly safe in saying that fruit-growing in Missouri is yet in its infancy. A few fruit centers are partly developed where the planting will be continued rapidly by those who are coining money out of the industry. Others seeing their works will be induced to plant. Other fruit centers will be started and opened up in many places where nothing is done yet. Our favorable location, railroad facilities, low price of land, fine climate, healthy, well-watered country, good roads, good schools and colleges, our magnificent State university, good churches together with her three million of good, moral, law-abiding, intelligent, hospitable, energetic, wide-awake citizens, is bound to carry Missouri onward and upward to a proud and enviable position among her sister states—and in years to come, as the world shall gaze upon the onward sweep of this mighty Republic, they shall yet behold our own beloved Missouri as the grand central and brightest star of the American Union.

BEE-KEEPING AS AN EDUCATOR.

By Emerson T. Abbott, St. Joseph, Mo.

I frequently hear a father say, "My boy has lost all interest in the farm and does not seem to care for any of these things;" and often the mother makes the same remark about her daughter. Now, the question arises in my mind, why should this be true, as I am sure there must be some latent cause for this condition of things. The natural tendency is for children to become interested in the things by which they are surrounded, and where children who have always lived on a farm grow up with a distaste for farm life, there must be some cause for it. I am inclined to think that in many cases the reason will be found in the fact that the parents of such children have done but little to make rural life interesting and attractive to them.

The earlier a child can be made to feel that it is an essential part of the farm life, the more likely it will be to remain on that farm and

devote its best energies to its future development. I know of nothing that so weds one to an industry as a sense of ownership in that industry. *My* and *mine* have a great attraction for all people, and especially is this true of the young. I can well remember what a lively interest I had in all horse-flesh when I could say *my horse.*

So, I would suggest to the fathers and mothers whose children seem to be growing tired of the farm and all that pertains to it that they try the potency of a colony of bees in connection with that magic word *my.* Give the bees to your boy and tell him that he will be expected to furnish the family with honey in payment for the use of them, but aside from that he can have all he can make out of them. Do not wait until he is 21 years old and has developed a dislike for the farm, and then do this to try to keep him at home, but do it as soon as he is old enough to look after the bees. Even though he may have to call for assistance from older heads and hands occasionally, he would better feel the potent influence of this word *mine* early in life.

If you have no boy, give some of the girls this chance. Or, if you are blessed with both boys and girls, give one the bees and the other the poultry, and see what a lively interest this mode of procedure will develop in farm life.

It is wonderful how much of an education can be gotten out of a few colonies of bees or a fine flock of poultry. Just as soon as a wide awake boy or girl begins to feel that these are my bees or this my flock of hens, the educating process begins. It is absolutely impossible for anyone to become intensely interested in a colony of bees without being greatly benefited. The care of bees develops the powers of observation, induces keenness of perception, and leads one to do things in an orderly and methodical way. It also develops the habit of doing the right thing at the right time, furnishes interesting and attractive employment for the mind as well as the body, renders the surroundings of the one engaged in the pursuit attractive, and thus leads to contentment and happiness. The boy or girl who is contented and happy at home will be in no great hurry to leave the farm for the strain and worry of the counting-room or store. Neither will such children ever wander very far from the path of virtue and rectitude. It is the idle brain that breeds mischief, and the girls who find time dragging heavily on their hands who go to the bad.

I say then, give your boys the bees, if nothing else; let him feel the sense of ownership; let him get the benefits of the education such ownership is sure to bring him, and in a very little while he will gladden your heart by the lively interest which he will take in all that pertains to farm life, and you may possibly be saved many a sleepless night

and days of worry for fear that he is going to the bad. I do not mean to imply by this that all boys who leave the farm will go to the bad, but I do mean to say that temptation will have less influence on them, if they are happy and contented in the home of which they deem themselves a working factor. It will not cost much to try the plan I suggest, and I feel sure every father and mother will be pleased with the result.

INSTITUTES FOR FARMERS.

By Emerson T. Abbott, St. Joseph, Mo.

Institutes are fast becoming one of the recognized methods of furthering the interests of agriculture. In many states they are as much a recognized factor for the enlightenment and elevation of those engaged in rural pursuits as are the teachers' institutes for the education of teachers. Missouri has made rapid strides in this direction, but much more might be done. It would no doubt be money well spent if a larger appropriation could be set apart for the institute fund, so that instead of holding forty institutes in one season, double that number could be held. This would enable the Secretary of the Board of Agriculture to cover the entire State in much less time, and it would, I think, add to the efficiency of the work by avoiding the necessity of the speakers hurrying from one institute to another, and being forced to make long rides by rail, or drives across the country, in order to reach the next appointment. In this way the speakers would come fresh to each new audience, and be able to do much better work; for, to say the least, this kind of work is hard on any man who takes an interest in it and puts enthusiasm in it. If anyone thinks the institute speakers have a "soft snap," he need but try it in order to change his mind. Some men might make a soft snap out of it, for they never get up enough enthusiasm about any kind of work to cause them to exert themselves much.

I want to call attention first to some of the things which the community in which an institute is to be held may do. The preparation made for the coming of the speakers is as important as the work of the speakers themselves. Everyone who has had anything to do with institute work knows that upon the thoroughness of the preliminary work depends the success of every institute that is held. When the people are ready, the seed sown falls in receptive and rich soil, and brings forth a hundred fold. When the community is not ready, it is up hill work from the start, and there is but little accomplished, and the only hope the workers venture to indulge is that, to change the

figure, a little leaven will be left that will work, and do good in the future, when other institutes are held in the same community.

If no preparatory work has been done before the regular institute force, which is employed by the State, reaches the field, in nine cases out of ten about all that can be done is to clear some land ready for some sower of seed who may come in future years.

It is hard to get many of the farmers to understand what an institute means; that it is for their benefit; that no one has any axes to grind; and that they will not be inveigled into doing something they do not wish to do; that, practically speaking, the institute does not cost them a cent; and that it only means that the State is trying to do what it can to advance the general interests of all who choose to show a desire to be benefited; that, in a few words, it is their institute.

Herein lies the opportunity for missionary work on the part of every farmer who knows anything about the character and aim of institutes. Let him begin at once to explain the matter to his neighbors; tell them how the institute fund is raised; who has charge of its distribution, and he should not fail to explain that these are men chosen from among themselves; what a great benefit may be derived by farmers, and all who may be interested in rural pursuits, getting together and exchanging ideas; how the coming of others among them who are practical men in the lines upon which they are employed to speak, and who have, or should have, an "aptness to teach," may stir up their own minds, set them at work, and in the end give clearer views of the possibilities and dignity of agriculture. When half a dozen men who are interested in such work can be found, then it would be a good plan for them to call a local meeting and get together with their wives and children and talk the matter over, and see what they can do of and among themselves to introduce better methods of work, increase the fertility of the soil, secure better cattle, poultry, horses and hogs, and possibly, get a few colonies of bees to sweeten up the journey of life.

If every community will hold one such meeting each month, I venture to say that they will be greatly benefited; and if the State Board arranges to hold an institute with them during the coming season, agriculture will take such a step forward in that community as will astonish the most sanguine among them. There will be no trouble to make up an interesting program after the work is once inaugurated. There are plenty of people who know some things that would be helpful to their neighbors, and most people who have never had any experience in trying to tell what they know can talk in public better than they think they can, if they will only be natural and go at it in a business way.

I said they should take their wives and children, and I want to emphasize this statement, for the farmers who leave their wives out of the program make a serious mistake. The benefits to be derived from the co-operation of the ladies in such work cannot be over estimated. Neither should the children be neglected, for they are to be the farmers of the future, and it is very important that they get a clear conception early in life of what agriculture means, the latent possibilities of it, which are to be developed in the future. If the boys and girls were more of them made to understand that agriculture in the highest sense is a science, and a noble one at that, they would think less about forsaking the farm for some hot-house life in the city. Let them learn what they can from the institute work, and then later on, they will not forget that there is a course in agriculture at the State University, and that it will be money well invested if they avail themselves of its advantages. The young man on the farm will never go far astray if he has learned to ponder well and takes to heart the words of the wise old Roman who said: "I come now to the pleasures of husbandry, in which I vastly delight. They are not interrupted by old age, and they seem to me to be pursuits in which a wise man's life should be spent. The earth does not rebel against authority; it never gives back but with usury what it receives. The gains of husbandry are not what exclusively commend it. I am charmed with the nature and productive virtues of the soil. Can those old men be called unhappy who delight in the cultivation of the soil? In my opinion there can be no happier life, not only because the tillage of the earth is salutary to all, but from the pleasure it yields. The whole establishment of a good and assiduous husbandman is stored with wealth; it abounds in pigs, in kids and lambs, in poultry, in milk, in cheese, in honey. Nothing can be more profitable, nothing more beautiful than a well cultivated farm."

The institute idea is an old one, but it has been greatly modified in our times. We are told that societies for the dissemination of a knowledge of agriculture were established very early in the history of civilization. One organized in Scotland, in 1723, was fittingly called a "Society of Improvers in the Knoledge of Agriculture." These societies soon grew into schools of agriculture of various degrees of efficiency. At one time there were over 200 schools in Ireland, which had small land holdings attached for the promotion of a knowledge of pratical agriculture. So it may be plainly seen that the importance of the ideas which are emphasized by the holding of institutes was fully appreciated years ago.

I have taken it for granted that the institute has a right to be, but now I propose to discuss briefly the why of this right, or in other

words, inquire what are the grounds upon which such an institution may claim the attention of the farmer, and command at least a small portion of his time.

I presume no one will deny the fact that the tiller of the soil, or the agriculturist, allowing that word to cover every class of rural pursuits, must of necessity get better returns for the labor expended than he does at present. In order to accomplish this, one of two things would seem to be necessary. Either larger crops must be secured with less effort better directed, or else more remunerative prices must be obtained. The prospects are not very flattering for an increase in price, as the tendency of things is toward cheapness. There would seem to be at present but one way to increase the price of any farm product to any appreciable extent, and that is to improve the quality. Goods of a superior quality always command respectful attention in any market. If the same amount of labor could be made more productive, then, of course, the total reward for the energy expended will be increased. This proposition does not require any argument to make it self-evident. If it did, assume that we live in any age of barter only, and the following illustration will make it clear: If it takes 10 bushels of wheat to exchange for a coat, six for a pair of pants, and two for a vest, and the farmer has been getting 18 bushels from an acre of land, then, if he can make the same acre, with the same outlay of energy, yield him 24 bushels of wheat, he will have six bushels to exchange for another coat, and so can have two coats instead of one—a gain of one coat.

This, then, may be brought about by better methods. These are invariably the outgrowth of an increase of knowledge, and there are but two ways for anyone to broaden his knowledge. By thinking things out for himself, independent of any external help—a rather hard way to get information—or by coming in contact with the information as found upon the written page, or expressed in words by the voice of his fellow-man. There is a certain inspiration about the latter method that always makes it attractive, especially to those whose minds have not been trained to close and logical thinking. Then, again, many difficulties arise in the minds of those who are seeking the information which may not have occurred to him who imparts it, and the living speaker being present enables him in whose mind the difficulties arise to ask to have them cleared up at once. More, there is that contagious enthusiasm, the influence of one mind over another; the fact that it always stirs to activity any mind which comes in contact with a number of other minds thinking along the same channels. This is simply another illustration of the power of co-operation; or, in other words, the farmers

of any given community acting as a unit in order to promote the best interests of all.

Here we find the reason for the institute work, or its right to be. One man cannot know everything about one industry even, neither will one man make all the new discoveries. An institute brings to each one the knowledge of all, and gives the less ingenious the benefits of the discoveries of the more investigating of his neighbors. It may have required years of experimenting on the part of the one who brings the information in order to reach success; and not only this, he may have incurred much loss by his experiments before he struck on the right plan. The attentive listener at the institute gets all of this in an hour's time, and not only saves weeks and months of anxiety which comes to those who are trying new plans, but also escapes the costly failures which come to men who are feeling their way to better methods.

Sometimes I am met with the remark: "We do not want anything to do with these new-fangled notions." The truth of the matter is many of them are not as new as some people are inclined to think. The idea of the rotation of crops is older than the Roman Empire, probably as old as Egyptian civilization. Pliny wrote centuries ago that the man who would keep up the fertility of his soil should "Sow next year's wheat crop on the field where he has just gathered his beans, vetches or lupines, or such other crop as enriches the ground." It will be noticed that these all belong to the leguminosae, and that, like the clovers which belong to the same family, they are all gatherers of fertility from the deep soil and the air. Strange to say, however, one of these lupine, from *lupus*, a wolf, was so called, we are told, because it was thought to destroy the fertility of the soil. Thus do old names hang to things after they have lost their significance; nay, as in this case, when the very opposite of that which they express is known to be true. Pliny's remark is friend Terry's clover talk, which he has so effectually and interestingly given to the farmers of the State in his institute work, over again. Virgil, as translated by Dryden, puts it thus:

> At least where vetches, pulse and tares have stood,
> And stalks of lupines grew (a stubborn wood),
> Th' ensuing season, in return, may bear
> The bearded product of the golden year;
> For flax and oats will burn the tender field,
> And sleepy poppies harmful harvest yield.
> But sweet vicissitudes of rest and toil
> Make easy labor and renew the soil,
> Yet sprinkle sordid ashes all around,
> And load with fatt'ning dung the fallow ground.
> Thus change of seeds for meagre soils is best:
> And earth manured, not idle, though at rest.

Clover was introduced to the agriculturists of England in 1645. by Sir Richard Weston, who speaks of it as being "in itself an excellent manure," and he also suggests the propriety of following a clover crop with a crop of wheat.

We frequently hear a remark like this: "I don't want any of this book-farming in mine." It seems to me that this is a mistaken idea. This is an age of advancement, an age of intelligence, an age in which the accumulated knowledge of the past is being applied to advance the material welfare of the people, and the farmer who fails to reap the benefit of this aggregation of the ages makes a serious mistake, in my opinion. He had just as well persist in using the tools of centuries ago as to refuse to avail himself of the help that chemists, botanists, geologists, mineralogists, entomologists and other scientific investigators have laid at his feet. There may have been a time when muscle or brute force alone could hold its own against all comers, but the man who fails to put brains into the cultivation of his crops in the future will find himself gradually losing ground until he will be left behind by the rapid march of the age, and the improved methods of the rising generation.

Here is a land

> Where is a soil, with fatt'ning moisture filled,
> Is clothed with grass, and fruitful to be tilled,

and the first work of the farmer is to till it according to the most improved methods. I know of no better place to begin to learn these than at a farmers' institute.

WHAT ABOUT SHEEP HUSBANDRY IN 1895?

By R. M. Bell.

Gentlemen: Since the day that our first parents were shut out of the Garden of Eden, sheep have been intimately associated with the well being of the human family. With the fall of man it became necessary for him and his descendents to provide food and clothing for themselves. In this new relation I have no doubt that the Almighty indicated the means and instituted a sheep husbandry exactly suited to their wants. It is certain that human civilization, such as has ever existed, has had some sort of a sheep which could be depended upon to furnish the means of protecting the people from the cold and with which to adorn themselves.

This has been the case for nearly 6000 years, and will exist to the end of time.

The question we have to consider today is not more serious or complex, than has often arisen, been discussed, and always settled to the advantage of the people and agriculture, in the ages that have passed. In all the evolutions of society, agriculture, trade and commerce, the sheep has been able to conform to all the requirements and more than hold its own. In other words, the sheep under its varied forms, with some specific husbandry, has come to stay as a prominent factor of good to the people of this world. It is the genious of man that must comprehend the situation, systematize capabilities and mark out the course to be taken, and use such economies and make the most of the opportunities that are within reach, to secure success.

The present status of sheep husbandry, not alone of the United States, but of all wool-growing countries, is not wholly surprising to those who have been studying the situation. The evidences of a revolution in sheep raising have been seen for years, but like everything else belonging to people, there was no preparation, and when the crisis came, no one was ready for it. There is no need here of recounting the circumstances that led up to the fatality now surrounding the sheep industry of this country. Twice before in the history of the country sheep have been similarly and in some respects more seriously depressed than has been experienced during the last three years.

In 1845 and again in 1866 the sheep industry was in a most deplorable condition, values were lower than during the recent depression and flocks were destroyed. Millions of sheep were sold for their pelts and tallow and went to the boiling tanks. In each of these instances and in the present the facts were, wool had no remunerative market price, and as all sheep were kept for wool, the ruin was universal. But fortunately for the American sheep farmers, there sprung up a demand for mutton and the 500,000 sheep that have already gone out of existence during the last three years have gone to market to be sold for as good a price as beef or pork. It is a fact that sheep have held their own better than any other class of meat animals and are still doing so.

Many new and valuable lessons have been learned within the last few years by those who have had the courage and skill to continue in the business. For instance, when 50-cent corn and $10-hog could not be used to grow wool, it was found that mutton could be produced on such feeds. It was also found that range sheep could be brought to the corn fields of Nebraska, Kansas, Missouri, Iowa, Wisconsin and Illinois and fed, making a new and profitable industry not hitherto known of.

For cattle feeding had been practiced in these corn regions by enterprising men, but sheep feeding marked a new period for the range flockman and corn raisers of the states named, and at once became acceptable to both. The result of which is now seen and felt in every nook and corner of the United States where sheep are raised. By this is meant that mutton is the first consideration with all sheep raisers in all this country. Let me say incidentally here that this change to mutton is the tendency in all sheep countries and will continue.

Ten years ago it was believed that 95% of flocks in this country were Merino blood, which is mentioned here to show that the whole sheep industry was for fleeces.

With the advent of a mutton industry the sheep business began to be diversified. New men with commercial ideas took up new lines that wool-growers failed to see, and the changes were wonderful. Some of these new men made vast fortunes in feeding western sheep, in breeding first class mutton sheep, and in lamb raising, while old-time legally entrenched wool-growers fell to kicking their unlucky stars and kicked clear out of the sheep business.

It was soon seen that sheep raising as a profitable business had not depreciated, as was thought, but had really advanced to a completeness, at least for those who had the skill and intelligence to make the most of their opportunities.

Among the new lines of profitable sheep raising, lamb raising, but little practiced except in close proximity to city markets, and then only in a small way, began to take prominence. This too became diversified in the raising of "house lambs" for the Christmas trade, and later on for the winter months. The good livers, the wealthy people in cities and towns east and west, north and south—all over the country—having tasted good mutton became fastidious and exacting and wanted lamb mutton not alone in May and June with green peas, but they wanted it all the while and were willing to pay for it.

Mr. Woodward of Western New York, 400 miles from New York City, was the first to engage extensively in this new branch of mutton raising. During the winter of 1836–7 Mr. Woodward marketed 750 of the best lambs from his farm. They were sold in the best form and finish at from six to eight weeks old, weighing from 30 to 50 pounds, dressed on the farm, sold generally on orders, at least on a special market, for from $15 to $18 per head. You see he was in the market with gilt edge mutton at a time when the other fellows were not there, when the demand was best and the market bare. This was shrewdness of the rarest kind. This showed what could be done by an intelligent

man who was looking for opportunities, and who was willing to prepare for the business and attend to all the details of the industry from buying the lamb mothers to finished product sold to his aristocratic customers in New York City.

Of course lamb raising became immensely popular with farmers who had the fitness and preparations for engaging in it. It was only profitable with men who studied the business and gave it the right attention from first to last, with men who were artists in their line. Lamb mothers, ewes properly selected for the business, were generally of Merino blood and for a time could be picked up in the country, but latterly hundreds of thousands of range ewes are shipped to Eastern centers cheap enough for the purpose.

At first, Eastern farmers used "black faced" rams, which meant Southdown, Shropshire, Oxford and Hampshire. For a few years, only a few, Cheviot cross has been very popular and bids fair to be extensively used here as in England where the breed has been built up for the especial purpose of winter lambs and lambs at any season. They are very prolific also, often having three and occasionally four lambs at a birth.

The selling of these fancy lambs is worthy of mention. Mr. Woodward dresses his lambs and ships them himself. The Virginia and Maryland farmers are so close to Washington, one of the finest markets, often sell their lambs on special orders. The New Jersey, Pennsylvania and Eastern New York farmers do the same way, as they are near the markets. Isolated farmers remove from market centers usually have to take less price as they do not have car-load lots.

At Goodlettsville, Tenn., there is a Lamb Club, which has proved highly beneficial to the 40 members which compose the club. They make two sales a year, one on May 1st the other the middle of June. On these days, fully advertised, both among the members and the lamb buyers, they come together at the railroad station where the cars are ready to take away the advertised number of lambs. The sales are made by sealed bids, and in an hour the transaction is made, the lambs loaded in the cars ready to start on their way to Boston. The May sale is two or three dollars a head better than the June lambs, because the latter come in contact with the Kentucky lambs, and for that matter, with a great rush from elsewhere.

It cannot be doubted that with such a varied and diversified sheep husbandry, with well studied systems wisely carried out in detail, the future promises greater stability and usefulness than has heretofore existed in this country.

The question most frequently asked by farmers is: What breed of sheep is the best? There can be no rational answer to this question unless the purpose for which sheep are kept is known. Again, a more important question than has been observed in the past, under a wool husbandry such as has prevaled, is what kind of land, rolling, mountainous or level? what kind of soil, whether poor and thin or rich and productive? since these questions make the value of pasturage on which sheep are expected to live one-half of the year.

No intelligent man would put the larger types of sheep on poor pastures; nor would he use them on hilly or mountainous pastures where they would have to spend much time in climbing and traveling to find what they need. Such sheep—the Cotswold, Lincoln and Lesters—were produced by big supplies of pasturage and where they did not travel much to get it. If such sheep are put upon inferior feeds they at once begin to deteriorate and are no longer the early maturing, symmetrical, useful animals they were.

It is of the highest importance to study the means used in making up breeds and then supply the same to sheep and all other farm animals. The law of inheritance is an iron rule, and "like will beget like," only when the supplies and treatment are like the environments whence their progenitors came. These surroundings, properly called environments by Prof. Waters, demand the closest study and most direct attention. It is known that sheep taken from good or bad environments and put upon a better regimen with proper management and wise selection in breeding, will at once show improvement in every characteristic without the infusion of any new blood. And the converse of this wil always be found to be true.

AGRICULTURAL SHEEP HUSBANDRY.

Since the best results are always found in connection with good farming, I think it unobjectionable to call such systems as authorized above agricultural sheep husbandry. It may be that the time has not fully come, but it will soon, when intensive sheep raising will accompany intensive farming, and the one will foster the other and forever remain inseparable.

It is well known that sheep and turnips are the sheet anchor of British agriculture. The farms of that country, having been in cultivation for thousands of years, were losing fertility until turnip farming was introduced, which furnished an abundant reliable supply of succulent feed so indispensable to successful mutton production. Nor are sheep less valuable to agriculture in other countries, as can be shown by referring to Germany, France and even our own country.

The Eastern farmers are now realizing the importance of raising their own fertilizers on the farms. Virginia and all the South are depending on commercial fertilzers, rather than sheep, and their lands show a steady decline, crops costs, too often, all they are worth to raise, to say nothing of putting them upon the market. As weed destroyers sheep are invaluable and are often credited on this account as well worth all the attention given them. Still another economy in keeping sheep is that as scavingers they gather a living off the farm from what would otherwise go to waste; they clean up fence-rows, ditches and odd corners which exist on all farms, and turn all such feeds into cash products wanted in the market.

It may be well to still further define the most profitable sheep for the future. The wool breeds and the mutton breeds need not be so widely different in character as some suppose. When mutton sheep are mentioned it need not be taken as British breeds, nor when wool sheep are spoken of it should not be understood as of Merino blood. It is true that Britania has many breeds of sheep and all are used for mutton, but it is also true that they all produce wool, and the agricultural breeds produce fleeces of exceptional value. But it is likewise a fact that the wool sheep or Merino, so abundant in America, also afford carcasses of excellent mutton that fetches as high a price when properly grown and fatted as any sheep on the market. If a distinction should be made, which is questionable, you will allow the suggestion that one be the British mutton breeds and the other the Merino mutton breeds, as there are several types in existence that are very deserving. To illustrate, in Western Pennsylvania, the Pan Handle of Western Pennsylvania and in Eastern Ohio are what have long been known as "Big Merinos." These were produced, as all breeds are, by the rich feeds both in pasture in summer and in yards in winter by a system of breeding and selection calculated to give greater size, better forms, earlier maturity and the best feeding qualities. There is no better description of these sheep than to call them the Standard Southdowns with superior Merino fleeces on their bodies.

The new beginner would ask what sort of a sheep to select for a foundation for a flock. If sheep are already on the farm, use them and cross with a strongly-bred thoroughbred. If ewes are to be bought, be sure to buy them of a vigorous type and as nearly alike as possible. It will be found best to take them from no better soil, pasturage, than yours. In no case take them from better lands, because they will have to adapt themselves to your soil and conditions, and may not be able to do this without degenerating. In selecting the ram see to it that he is a representative of his breed, of medium size only,

masculine in every particular, of vigorous health, hearty and of strong inherent qualities, such as you desire to introduce into your flock; such as will sell for top prices. Having bought only such sheep as you want, make it a rule to sell only what you do not want to keep in the flock.

The importance of pastures must not be overlooked. Just what constitutes a good sheep pasture is not easy to define. It would be far easier to describe what is not a good pasture. Every sheep farmer must decide this for himself and on this basis: A pasture must keep the sheep in strong condition during the season.

It is possible, and with the close margins and close competition imperative upon the sheep farmer to practice economy in the production of his products. This cannot be done by feeding sparingly, nor by using inferior feeds which would thwart the designs, but by using "catch crops," crops that do not interfere with the regular farm crops, such as rape, turnips, beets, beans, cow-peas, etc.

In the future sheep farming, clover is to be a very prominent factor both as pasture and hay. Corn fodder will solve the forage question for the flocks when we know its value and have the industry to use it.

Discouragements need discussion here. Among these topics the sheep killing dog must come in for a share.

It is as natural for the dog to chase a sheep as a rabbit, and the average dog would get more fun out of a sheep. It is more often that the dogs chases and kills sheep for fun than for what he can eat, as you all know.

In my long practice it has been a rule to get the dog before he got my sheep. To do this many plans were followed. The shot-gun suited me best, but there was too much noise, too much danger of getting into law suits, and it had to be used with discretion or when the case was urgent. Strychnine worked well, but one tires of carrying bits of prepared meat in his pocket all the time. Many dogs were hung up by the neck, but it was catching before hanging. On my farm no dogs were electrocuted, but lots of them "got thunder," for the fight was "on" day and night for years. There were no conscientious scruples about killing dogs.

Fencing the dog out came as a final and most practical remedy. Thanks to the age in which we live—the steel wire age. The Page Woven Wire Fence or similar fences, four feet high, will be a sufficient fence against dogs. Try it both around pastures and yards, and there will be no more trouble about sheep killing dogs. You can go to church and the pastures are safe from "curs." You can go to bed and go to

sleep without keeping the shot-gun handy to jump up and rush out in the dark, rain and mud to scare the dogs away.

Diseases of almost innumerable sorts are a great drawback to sheep raisers. Years ago we knew but little about any of these. There came a time when we had to learn and the sources of information were very poor. An experience with scab would amuse you, but to us, 40 years ago, it was a very serious thing. Cooper's Sheep Dip Co., Galveston, Texas, will send you a little book that tells all about scab, ticks, lice and other diseases. There is published by the General Government a treatise on Animal Parasites in Sheep, a work projected by Hon. Norman J. Colman, when he was Secretary of Agriculture, that no sheepman can be without. Write your Congressman at once and get it for the asking.

Of these parasites, the internal worms are the most deadly and as yet most difficult to manage, because some of them are not yet understood by our veterinarians. You know what it is to lose lambs during the summer and fall by "paper skin," pall disease, as commonly called. This is a worm in the wind-pipe or throat, something similar to the thread worm in chickens' throats, known as gapes. It is easily treated and no longer need cause losses. The formula is turpentine and raw linseed oil, half and half. A teaspoonful is a dose for a lamb. Give every morning for three days, miss three, then give two mornings and miss two, and give one more dose. If lambs continue to cough give the medicine again, which will rarely occur. If one is affected give the treatment to all, because all have it and may, later on, succumb. Be sure about it.

Now, gentlemen, these are some of the topics I desired to discuss with you today. There are many others equally important must be learned and will by and by.

Let me urge upon you to inform yourselves along these lines, because the future successful sheep raiser will be so because he knows his business and follows it scientifically.

You young men, let me tell you something, and I hope you will remember it. It was Horace Greeley who said "Go West young man and grow up with the country." Well, now don't you do any such thing. Stay in the grandest State in the Union. Stay in the best country on earth and develop the State of Missouri. You go West? No, there are mover wagons all over Missouri today trying to find homes. These, some of them, I know, are fleeing from the drouthy West. They know more than they did a few years ago when they crossed the State of Missouri, perhaps on the cars, for they had more money then than they have now. As these went West they were scared because of wild

stories they heard about your State. They are here to do as well as they can. Many of them will do well for they know a good thing when they see it. Now I don't ask you to grub out the Jack oaks, to plow the Ozark hills, but I do ask you to try to have and use sheep to clear up the waste and wild lands until there is not an acre of land in Missouri that is not productive. Sheep will do it and make money for you, make your homes beautiful, that will make both you and our grand State the wonder of the world, and all because you were intelligent sheep raisers.

SHEEP HUSBANDRY AND FEEDING.

By T. T. Fulkerson, Trenton, Mo.

Very few farmers have ever given this subject the attention it deserves in the ranks of progressive and profitable farming.

The sheep industry is not one which belongs to a capitalist and which is best and most profitably handled in large flocks, as is often supposed, but can be made profitable in any phase of its existence.

No farm should be conducted without a few sheep at least; they will not only prove a source of much profit from the sale of their fleeces and carcasses, but will be found to be of great benefit in the way of ridding a farm of weeds, brush and sprouts.

I have often heard intelligent and knowing farmers remark that a man who keeps sheep invariable has a neat farm and well cleared of burrs.

It is true that wool is now low, much lower possibly than ever before, yet *do you know* that wool at present prices will pay the entire cost of caring for and feeding the sheep a year? This will then leave the lamb a clear profit, "and if the farmer use diligence he should raise as many lambs as he owns ewes." This lamb, at six months old, if properly nourished, will bring almost, if not quite, as much money as a grown sheep, which, with the improving demand for mutton, is an easy and sure source of profit.

It has only been a few years since mutton became popular as a meat, and the export demand which has sprung up within the past two years for choice wethers weighing 120 pounds and upward will force the grower of Merino and close wooled sheep to breed for a larger frame, and also combine it with the heavy weighing wools which are not found in the combing wool breeds.

The close money market with other influences have caused the markets on all wools to become very druggy, and especially for wools on the fine order. I would therefore suggest as a very profitable and

possibly the best grade of sheep for this country, is a cross with the coarse wools of either the blackfaced or Cotswold varieties with the Merino.

This cross you will find will give a robust form of model proportions and a quality of wool which is almost as high priced as the combing wools, and will possess much more weight to the fleece than any of the coarse wooled breeds.

To those parties who have had the good fortune of being over supplied with corn this season, I can suggest nothing more tempting than to enter the markets and purchase a supply of those choice Western wethers and feed them for the winter or spring market. It is now the season of the year when ranchmen growing short of range and realizing the near approach of winter with an over supply of stock, ship their half fat sheep to market in such numbers that buyers can hardly be found to take the surplus, and choice plumb-feeders can be bought very cheaply.

These Western sheep, when fully matured, present a fine specimen, and can be found in our markets by the thousands, weighing from 100 to 120 pounds off of grass, and sometimes as heavy as 140 pounds when fatted on screenings or corn. They form very strong competition with our best native sheep, but sell a little lower on account of their wild nature and the thickness of their pelts, which are very heavy, forming a protection from the cold of the northwest.

It is my opinion the feeder of these sheep will only have to wait until this Western grass supply is cut off, when the export and home demand will so strengthen the market as to realize him a handsome profit.

SOME CHANGES IN HOG RAISING.

By Major R. M. Bell.

GENTLEMEN: The American hog is so important a factor in profitable farming that no Farmers' Institute meeting is complete without discussing its management and best development. Just now there is an interest in the raising of hogs that has never been equalled before in the history of the business of this country.

In considering the subject assigned me, it is quite natural for me to review what I know about hogs. You will pardon me for this diversion, though running back half a century and outlining what the pioneers of this country thought were good hogs.

About the most interesting bit of hog history I read when a boy was when the Savior cured the man of the legion of devils, who lived

in the tombs. It seemed these were afraid they would be cast out into the deep, and so begged that they might enter into a herd of many swine that were feeding on the mountain; and their request being allowed, the whole herd ran violently down a steep place into the lake and were choked. I imagined some of those hogs escaped drowning and that my father had some of the same breed, because I knew our hogs had the devil in them. In fact, I have heard my father talk about casting the devil out of them, which confirmed me in my opinion of them. To this day I can remember how pesky mean our hogs were, without an exception, from the day they were born to the very day they were killed, and they died game. I will confess to you honestly that I was afraid to eat their meat lest I, too, should be possessed with the evil spirit. Some of you young men *of my age* will recollect these hogs. They went by several names—Hazel Splitters, Elm Peelers, Razor Backs and other names less elegant, especially when people wanted to do anything with them.

It must be said to their credit that they were hardy, vigorous brutes; they had ravenous appetites, always ready to eat, given to picking up chickens, gashing young lambs, calves, in fact anything, dead or alive, and to my childish fears as ready to eat little boys as anything, if they could catch them. To me then, an old sow, or worse yet, an old boar, with great tusks, wild eyes and long bristles which they could make stand up straight on their necks and shoulders, were the most fiendish creatures that walked the earth, and far more dangerous than wolves, bears, Indians or even hobgoblins.

These pioneer hogs were never in a hurry about anything we wanted done. It took three or four years to get them ready for market. When they were fat it was advisable to kill them at home, because they were so bad to drive the way you wanted them to go; I have in mind a drove of fat hogs that were driven 20 miles to market in one day, and the drivers had to go on horseback. The day's drive was to Alton, Ill. I do not know how they were stopped, possibly by the Mississippi river. It was not necessary to take wagons along to haul the broken-down hogs. No, no; those hogs could be depended on to keep agoing.

You, young men, I imagine, will wonder how we raised hogs of the ages mentioned and escaped cholera. Let me say there was no such disease known in those times. Hogs died, as I remember, of accidents, though rarely; they had blind staggers, kidney worms and influenza, but not cholera. The first hog cholera we knew of was about 1857-8, which occurred with some hogs at Jersey Landing, above Alton, Ill., that were being fed on distillery slops. The idea of hog cholera, or swine plague, as it was sometimes called, created a great sensation among the people.

We were not sure but people might have these diseases and we all be destroyed—hogs and people together. I was a young man then; was raising my first hog crop, and, like young people will, was counting my chickens before they were hatched. I was counting on $600 from my first sale, and was almost planning what I would do with the money. Well, the hog cholera came to our farm and my shoats all died. It took me a good many years to get over my loss of $600 in prospects.

You may think me a little "off," but I must tell you that hog cholera proved a blessing to us in disguise. It is a question in my mind if we would have made the improvement in breeds and in management of hogs if it had not been necessary to do so that we might escape the visitations that came then only every year or two. I am not certain that this plague among the herds of this time is not a blessing to the country, because there would be so many hogs raised that there would be no market for them; and if there was you would all make money so fast and get so rich that you would forget your prayers and lose your souls. Let me say here that I regard the pluck and perseverence of farmers in raising hogs despite the diseases or disease—for there is only one—cholera, as most wonderful and commendable.

Is there no remedy? You who have heard Dr. T. J. Turner, the State Veterinarian, a young man fully abreast of the times in animal pathology, will never forget his earnest protest against "sure cures" and all nostrums said to cure cholera hogs. He does believe in prevention and told what to do with the well hogs, the sick hogs, and the dead ones, too. On this subject let me here commend the views of Dr. Turner as eminently conclusive on hog cholera and urge you all to follow out his suggestions.

The time was when the general impression among farmers was that the improvement in hogs was somehow responsible for cholera; that the improved hog had less vitality, less constitution, less ability to resist the disease. I do not think so now. In fact, I think just the other way.

It would not surprise me any day to hear of some one who has "old fashioned" hogs that were cholera proof, and really have a trade in the next thing to "razor backs."

The best types of hogs today are to me almost miracles in every excellence that goes to make up a money making animal on the farm. Constrast with me the sort of a hog we had 50 years ago and the average specimen, to say nothing of the best found on Missouri farms. Hog raising is intensified as is no other live-stock industry on American farms Think of making pigs six, eight and ten months old weigh 250, 275 and 300 pounds, just exactly what the packers can use most

profitably in their business. These results are not at all exceptional; any farmer with the right sort of blood can do, and they are doing it, all the while.

Breeds—I hardly know what to say about this part of my subject. As you will find in the stock-yards and show-yards, too, good hogs are all of nearly the same type. They differ some in size, mainly owing to the age at which they are pushed to maturity. They differ in color more than anything else, and are black, white and red, just to your fancy, but all good, as near perfection as can be hoped for.

Let me refer you to the very able lecture of Prof. G. W. Waters, on breeding and feeding of live stock, where breeds of hogs are carefully discussed from scientific standpoints. You will become infatuated with the subject and be able to put what he says into profitable use on your farms. There is a need of putting more humanity into the feeding, care and management of hogs.

In the great corn belt which is and must forever be the hog belt of the world, hogs are fed corn from generation to generation and nothing but corn. I cannot but think that this is wrong; that it tends to weaken digestion, at least to fatty characteristics in the meat that damages, at least the quality. I sometimes suspect the vitality, too, is less resistive to disease with hogs so fed so long. The water to which hogs have access is not given due attention. What could afford a more congenial habitat to microbes than the cesspool assigned to hogs on all farms?

Why should hogs be required to live out of doors day and night, winter and summer, in rains, snows and cold? If there is any one thing that should distress a good man, that should drive him to insanity and suicide, it is the inhumanity practiced toward these dumb brutes. Let a man, any of you who keep hogs, eat one kind of food, have no change, drink such water as is usually given, sleep in such beds—scant, wet, stinking—the year round, be required to take the suns of summer and the storms of winter, try it and see if he is treated fairly. He will die in less than six months, as his hogs do often, and no one will wonder at it. Think, too, where hogs are fed, often in the mud, the same place on the farm—always in the same place, whether it is mud or dust—think of the poisonous germs to be inhaled into the lungs, the filth that must go into the stomach—diseased portions that have passed time and again through the animal. Think of the contaminated air that hogs have to breathe in filthy yards where for years and years hogs have been fattened. Have you not seen such hogs when perchance they are turned out of such foul pens, stand holding up their noses and breathe in God's free air with keenest appreciation?

Pastures deserve attention from all hog raisers. It has been said by one of the best hog raisers in the United States that "an acre of good red clover will make 400 pounds of pork with well bred pigs." If asked what would be the next best pasture, I would say another acre of the same kind of clover. Hogs will eat all kinds of grass, some kinds of weeds, all sorts of fruits and nuts, and should have them. But what is the practice of the general farmer?

Economics in feeding are scarcely worth noticing among farmers in the corn belt. If a man has plenty of corn, a poor, skimpy clover lot, a little orchard where the pigs may get an apple or two a day, a few peaches a few days in an occasional year, he thinks he has provided extravagantly for his hogs, and they ought to be exempt from disease and he get rich. According to the statistics of the United States Department of Agriculture Missouri has 3,561,136 head of hogs, being second in rank among the states. But the State is away off in average value, being $4.51 per head. These figures are furnished from the assessor's books, and while safe, are in no sense reliable. You know when that county official comes around to take an invoice of stock as a basis for taxation, most men suddenly become mighty poor and forget how many hogs they have, and are sure to make them all pigs and very low in value.

In passing over the State I notice with pride the fact that the old fashioned scrub hog has been eliminated from the farms. Even the range hog, the hog that runs in the open woods, has been modified by the Berkshire and his half-brother, the Poland China, and no longer looks and acts like a scrub.

The farmers of Missouri see the importance of a higher purpose, of better blood and methods, and are in touch with people of any state in progressive, intensive hog raising.

DAIRYING IN MISSOURI.

By John Patterson.

The necessary conditions for a big development of the dairy industry in Missouri are not excelled by any state in the Union, and still she devotes so little of her work in that direction that she does not nearly supply the requirements of her own cities. Many thousands of dollars are sent to other states for the dairy products needed. No good reason can be given for this condition only that the farmers have been engaged in raising hogs and cattle from the first settling of the State, and do not realize that they could do better by changing their lines of

production. Besides it will take some time to learn the dairy business so that profit may be expected. They must learn to give the cows good care so as to produce good returns. They must have plenty of good and suitable feed and be kept in good and comfortable quarters. Those cows which do not produce enough to pay for good care must be disposed of and only the paying ones retained. It takes some time for a beginner to learn this so as to make his business profitable, but the faster he learns the sooner comes the profit. Poor feeding, bad quarters and rough usage are sure to make the income too small to pay, and must be changed. The breed of cows must be determined by the man's own fancy. There are some good cows in nearly all breeds. The Jersey has more to recommend her than any other breed. Her fault is her steer calf is not considered worth anything. I don't know if butchers ever will quit cursing them. The writer has practiced raising nearly all so far, fed them till two years old and then sold them as butcher's stuff, and found them as profitable as the heifers of the Shorthorn. The grade (½ or ¾ blood) Jersey heifer will bring a calf when two years old, and pay for her keeping from that time on. If she developes into a good milker when she has her second calf she will readily sell for $40, while a Shorthorn heifer of the same age will only sell for $25, and so far I have found I can make as much at raising grade Jerseys as Shorthorns. Besides they produce more butter for the amount of feed than any other breed I am acquainted with. For all the objection the butcher makes to the steer, the beef is considered very tender and palatable. His only fault is that he is too small where the valuable steak is cut.

The milking should be done by good, quiet, cleanly hands that can either do their talking before they commence or put it off till after they are done. A neat box 8x12 inches and five or six inches deep makes the handiest milk stool. Take it in your right hand, bucket in left hand, step sideways in between the cows, set box under you, brush off all dust or straws before bringing bucket under, and when ready to milk pass bucket so as to be held between the knees, and milk with both hands without wetting the teats with milk, pressing the teats with the end of the fingers against the palms of the hands. When nearly done strip the last drops between the thumb and front finger and be as particular as possible not to let any impurities get in the milk. Get all the milk there is in as short time as you can learn to milk, as fast milkers get more milk than slow ones. Commence milking at the same time, night and morning, winter and summer. It suits our circumstances best to commence at 5 o'clock. Whether you make your butter or send it to the creamery, I think it will pay best to run

the milk through the separator as soon as it can be done after it is drawn; then take the milk while it is yet warm and sweet and feed the calves. In that way, if your separator is a good one, all the butter fat is taken out and is separated from all impurities, and the butter will be a more fancy article. If you furnish a creamery it saves the hauling of milk there and back again, and sweet milk can be used for feeding. This is decidedly the best way, and will soon pay the expense of buying a separator and doing the work. As soon as the cream is gotten from the separator it should be cooled down to 60 or 62 degrees Fahrenheit. Then if more cream is to be used in the same churning it should be mixed and held to that temperature till ready for churning. Churn at a temperature of 58 in summer and 62 to 66 in winter. Put enough coloring matter in before commencing to churn to make it as yellow as butter from a good grass pasture in June. Stop churning when the butter is in grains as large as wheat. Draw off the buttermilk, dash in cold water, shake it down, then draw the water off and repeat till the water does not look milky. Then let it stand 15 minutes, so as to draw all the water off. Put in about one ounce of pure, fine dairy salt to a pound of butter. Shake it around to mix the salt well with the granules of butter. A good butter-worker is much the best thing to work it even so the salt won't make any streaks, but if you have no butter-worker, mash it well over with a potato-masher. Pack it immediately, or print to suit your market.

For summer I have a woodland pasture that was overgrown with timber and a variety of brush that has nearly all been cut off and burned. It is half bottom and half upland. The prairie part of the bottom was plowed to kill the bottom grass, ditched so no water could stand on it, and sowed with timothy, clover and red-top. It is now mostly grown with red-top and blue-grass. Blue-grass and white clover grow well on the upland. A creek runs through it. I turn cows in about May 1 and they eat it very even so that there are no bunches left, which I so often see in cow pastures, and if coarse weeds spring up I either run a mowing machine over them or cut them with sharp heavy hoes about once in four years, or as often as required. The man who churns gets some time afterward to fix feed in the barn and bring in cows. He puts them in before 5 o'clock, and when the other hands come in and we eat supper, each hand commences milking and lets the cows out as fast as he has milked. In that way he has no hot cow at his back, and when all are done milking all the cows are out, going to a 40-acre pasture of clover and timothy. This arrangement works well as long as the season is good. But as soon as extreme dry weather sets in and the cows begin to decrease in milk, I

give them something to keep it up. Anything of which they will eat enough will do. Much advice has been given to dairymen to provide sowed sugar corn, but I use common field corn, run it through the cutting machine, and think it as good as any. For winter feed I cut corn when the shuck begins to show dry, set in as big shocks as are safe to keep from molding, tie well at top with binding twine to keep from being damaged, let it stand till needed at barn, then run the corn and fodder through a cutter run by a two-horse tread power, cut to ¾-inch lengths. This mixes the corn with the fodder and the cows masticate it better than corn fed by itself and does them more good. To that if about four pounds of wheat bran and two pounds of oil meal are added per day with ten pounds of clover hay, good cows will give good results. Timothy hay is not an economical feed for milk cows.

Calves need careful treatment to make you profitable future cows. I let them suck the first three days, then feed them milk as they seem to require. When they have learned well to drink, I mix skim milk with the new milk, a little at first, increasing the amount each time until in about a week's time I use skim milk altogether. For each calf mix a heaping tablespoonful of oil meal in a half pint of boiling water and add to the skim milk. This will make up for the cream that is taken out. As soon as the calf can chew, give him some good hay and a handful of oats or bran. Do not let your heifer calves, of which you want to make good cows, get poor or fat, but keep them as near medium as possible. When a fresh cow seems healthy and all right, the ninth milking will do to go with the other milk, but if she does not seem healthy, do not use the milk for anything but pigs.

I consider it very desirable that we should go to dairying more generally, as it would be sure to improve our money income, and more fertilizers will be saved to put on our land. When we learn to make good use of cows and clover, we will have better farms and will be richer and happier farmers.

HAWKINS' MILK DAIRY.

By Elijah Hawkins, Hannibal, Mo.

My own experience in managing a dairy during the past ten years has consisted in that branch of the business which supplies a market with milk and cream and incidentally butter. The undertaking sought to accomplish three things. Beginning with a very poor farm well located adjoining Hannibal, Mo., with fifty grade Jersey cows, the first object was to increase the quality of the produce of the herd. That

having been done and a consequent increase in the demand for it ensuing, our next object was to meet it with an increase in the size of the herd. The third objective point would follow as a consequence of the second in the increase in the productive capacity of the farm itself by reason of its enhanced fertility from manure produced by the enlarged herd.

The three objects then were an increased number of cattle, producing a better quality of milk and a better farm. The first move made was the acquisition of a registered Jersey bull, sired by Stoke Pogis 5th, Dam Pauline 3rd, 2nd Dam Pauline, 494. This bull was bought because his sire was almost a full brother to Matilda 4th, 12,816, who gave in one year 16,153¾ pounds of milk, which was tested 144 days in eleven different months and estimated to have yielded fully 950 pounds of butter. She has yielded more milk and butter than any other cow in the Jersey breed. He was bought because his dam was by the best son of Victor Hugo out of his own dam Pauline, and because this combination of blood had produced Ida of St. Lambert, whose record of 30 pounds in seven days, 67 pounds of milk in one day, 455½ pounds of milk in one week and 1891 pounds of milk in 31 days was unequalled for the respective periods. It also produced Mary Ann of St. Lambert, record 36 pounds of butter in seven days. He was a beautiful solid silver grey in color, of large size and fine proportions. We enlarged our stables to 100 stalls, which were paved with flagstones laid in Portland cement, open to the roof where ventilators were placed 10 feet long at intervals of 20 feet. No stanchions were used, rope halters instead, allowing the cattle greater ease and comfort. We gave extra care to cleanliness in the stables, bedding with shavings regularly and using air slacked lime liberally every day after cleaning house. No manure was allowed to lie in the stable-yard—wagons being placed at the doors each night in which the manure was wheeled every morning and hauled to the field and spread. In summer all flies were destroyed with fly powder each day before milking the herd. We found this of great service, especially the destruction of those venomous little pests, the horn flies. The stables were kept bright with whitewash.

Our milk vessels were all cleaned by steam. By means of a windmill we pumped water into a large tank from which we drew the water into troughs in the stable lot, and in winter we warmed the water by drawing it through hot pipes. We stored 200 tons of ice per annum and used it plentifully in cooling our milk.

We advertised these facts liberally. We improved our delivery wagons, using the best we could buy with beveled plate glass windows

and other expensive finish—used nice harness and drove registered trotting horses to these wagons, which insured great promptitude in our delivery and other movements. We were the only persons here who shipped into the community linseed meal in ton lots for food for our cows; we often used as much of this food as $100 per month; we contracted for large lots of sugar beats with neighboring gardens, which also furnished us carrots in large quantities. We grew corn upon heavily manured land which we fed green in the dry months of summer and fall, and were generally forehanded and thoughtful to keep a good bill of fare for the cattle, composed of as great a variety of foods as possible.

We bought for use in our herd a son of Matilda 4th, by Ida's Rioter of St. Lambert.

This bull probably cost more money than any Jersey in the Mississippi valley. We bought also another son of Ida's Rioter dam by Michael Angelo (son of Eurolas), and dam by Stoke Pogis 5th.

Supplementing the manure made on the farm, we employed two wagons for sixteen months, all the time hauling manure from stables in Hannibal, spreading it as a top dressing for our pastures. We hauled over 2000 tons during that time.

The quality of the animals we bred and grew was much improved, the numbers quadrupled, the production of the farm was largely enhanced, and the trade absorbed the product at good prices, until none was left me in summer during the whole of the past ten summers with which to make butter for the use of my own family. I have bought butter for my family during the hot season every summer within that time.

FARMERS' NATIONAL CONGRESS.

By Dr. J. L. Minton, Delegate from Missouri.

The Farmers' National Congress is a regularly organized body of representative farmers whose delegates are appointed by the governors of the several states. It is non-political.

A constitution and by laws govern its members as in other regularly organized bodies. The organization has been in existence about fifteen years, and has grown into popularity and usefulness from a feeble beginning with only a few states represented, until at our last annual meeting in Atlanta, Ga., Oct. 10, 1895, not only almost every state in the Union was represented, but also Germany and other foreign countries, and many of the South American states sent delegates and were ably represented.

The farmers representing about half the population and wealth of the United States feel keenly the need of thorough organization and correct representation both state and National. Its object is to advance the agricultural interests of the Union, to mold and shape such legislation as the interests of the farmer require, and present it to state and National legislative bodies for their action. Among them is to be found a proper readjustment of our tariff laws, the importance of employing expert engineers to examine and report upon the practicability of reclaiming our arid and semi-arid districts by irrigation, the enactment and better enforcement of laws to prevent trusts and combinations of capital from controlling and depreciating the prices of farm products, the amendment of interstate commerce laws so as to entirely prevent unjust discrimination against any locality or person in the shipment of freights, to enlarge the Department of Agriculture to the dignified position to which it belongs, giving it power and funds sufficient for investigation of our trade relations with foreign powers, respecting the importation and exportation of farm products, the enlargement of free mail delivery in rural districts, and above all to wisely and properly adjust our monetary system to the business needs of the country.

Realizing that a protective tariff which protects and supplies, revenue and a tariff for revenue which supplies revenue and protects, is essentially a protective tariff differing in degree only, the farmers claim that while these conditions exist they have a right to their just measure of protection, and while not questioning the principles involved in the tariff proposition, I present the following as the action of our Congress and other bodies and passed by a conference of delegates from the organizations represented therein at a conference of delegates held at Worcester, Mass., Nov. 14, 1895, in which conference I had the honor to represent the Farmers' National Congress and this State as a delegate:

To the American People and the Congress of the United States:

At a conference of representatives of Chambers of Commerce, Boards of Trade and delegates of Farmers' National Congress and other commercial organizations from the various sections of the Union, and delegates of the National Grange, Patrons of Husbandry, under the auspices of the National Grange, Worcester, Mass., Nov. 14, 1895, the following resolutions were adopted:

Whereas, Agricultural staples being exports, cannot be protected by a tariff on imports as are manufactures, and American ships in the foreign trade being built of partly protected material and under protected wages are at a disadvan-

tage in the world's competition with ships constructed and operated by cheap labor of free trade countries,

Resolved, By this Conference, that this depressed condition of American agriculture and American shipping demands the enactment of such legislation as will put both these great industries upon a footing of equality with those now especially fostered by the Government.

Resolved, That we call upon Congress to equalize the protective system by extending to agricultural staples and American shipping in the foreign trade that just measure of protection to which they are entitled so long as protection is the controlling and public policy of the nation.

Resolved, That we recommend to the Congress of the United States and to the American people what is known as the "Lubin Proposition" for the protection of American agriculture and shipping in the foreign trade.

The same resolutions, in substance, have been recently adopted by the Chambers of Commerce of San Francisco, Seattle, Washington, Portland, Oregon, the Board of Trade of Bath, Me., the leading Atlantic Coast Ship-builders at a meeting in Philadelphia, and the Farmers' National Congress at Atlanta, Ga.

The "Lubin Proposition" is for the protection of American agricultural staples, a portion of which are exported, by the payment of a bounty by the Federal Government upon such exports and the protection of American shipping in the foreign trade, to the end that all industries in the United States which, in any manner compete with the cheaper labor of foreign countries, may be protected equally with such industries as are now protected by a tariff on imports.

For seventy-six years a similar policy was in successful operation in Great Britain, and it only ceased when that nation no longer exported agricultural staples, after which the tariff upon imports protected her agriculturalists until the repeal of what is known as the "corn laws."

It is believed that the enactment of laws of this proposition will have the effect of making steadily profitable the pursuit of agricultural employment and replace present threatened disaster to our farm-owning population by prosperity, the result of which would have an equally beneficial effect upon our great manufacturing industries, which are so vitally dependent upon our farming population for the purchase of their products. And it will effect for shipping in the foreign trade a stimulus to ship-owning and ship-building to such extent that our own home-built, home-manned and American-owned vessels shall once more carry the larger share of our foreign commerce, thereby creating a much greater home market for American farm and factory products among those engaged in shipping, and the retention in the United States of the many millions of dollars which

we now expend annually to enrich foreign ship-owners and ship-builders.

We earnestly urge upon the American people and the Congress of the United States the early and favorable consideration of such measures on the lines here indicated as shall give prosperity to all American industries by equitable protection.

Unanimously adopted.

(Signed by) J. H. BRIGHAM, Chairman,
and Master National Grange, Patrons of Husbandry.
HUGH CRAIG, Vice-President,
and Vice-President San Francisco Chamber of Commerce.
ALEX. R. SMITH, Secretary,
Representing Leading Atlantic Coast Ship-builders.

The work of the Farmers' National Congress could be materially strengthened if the delegates named by the Governor would meet in annual session with the State Board of Agriculture and thoroughly discuss the questions that would likely be considered by the Congress. A better expression of the farmers of the State would then be obtained, and could be presented with more force than if it was only an opinion of the delegate and possibly did not represent his people.

Again, we would suggest that the Western States will not have such an attendance of delegates as will give them the strength and weight to which they are entitled and as will fully represent their great agricultural interest until some arrangement is made by the states to pay expenses of the delegates, as is now done by the Eastern States.

The farmer may be willing to leave his home and sacrifice his time in the interest of his calling, but very few men will feel able or will care to pay all traveling expenses incident to a trip across the country for the purpose of considering and discussing measures in the interest of the whole country and in the interest of a calling upon which all others depend for success.

The State of Missouri and most other Western States depend almost exclusively on agriculture for sustenance and the accumulation of wealth. What tends toward the building up or developing of this industry cannot be neglected without detriment and the loss of profit. Such action as will secure to us a full representation in the Farmers' Congress will be a profitable investment, and should be taken at an early day.

POSSIBILITES OF NUT CULTURE IN MISSOURI.

By Prof. J. C. Whitten.

In taking into account the agricultural interests of Missouri, we should not lose sight of her forests, particularly the nut trees, which form so important a part of her natural resources.

The rapid denudation of the forest areas of this country and the limiting of the supply of the best timber for building material, agricultural implements and all kinds of wooden ware is beginning to arouse the people of the United States to the question of proper forest management. The popular agitation of this question gave rise some fourteen years ago to the organization of what is now the American Forestry Association. Michigan, Minnesota, Ohio, Pennsylvania, and other states have local organizations for the interest of foresty. The Department of Agriculture at Washington maintains a division of forestry for the study of forests of the country, and for conducting experiments for the promulgation of proper forest management.

The result of these efforts in behalf of forestry will eventually lead to a better conservation of our forest values, and a more economical harvesting of our forest product. Germany, with forests under governmental control, has adopted a system of forest management little dreamed of in this country. They measure the value of their forests by the amount of wood that can be annually produced, under the management of skilled foresters, adopting a proper rotation, for all time to come. We have always measured the value of a forest by the amount of wood that could be swept off in a single year, denuding the forest area and perhaps leaving it to grow up to weeds and bushes or, worse yet, to wash away into the valleys below. There is need then of serious consideration of our forest interests. Missouri is awake to her immense agricultural resources, and her splendid products are a leading feature upon show tables at public expositions. Meantime we should not fall behind other states in availing ourselves of all that can possibly be obtained from our forests.

The nut trees are well distributed over our State, and are one of our most valuable forest products. There is, perhaps, not a county in the State that does not produce one or more species of edible nuts, and the State, as a whole, produces nearly all the important species of nuts indiginous to the United States. The hazelnut is generally distributed over the State, one or more species of hickory is found in almost every county, the pecan flourishes in the eastern and southern

portions, in the rich woodlands of the southeast the beech flourishes and ripens its delicious nuts, the elevations of the Ozark produce the spreading chestnut trees, while the walnuts reach magnificent development in nearly all parts of the State.

Nearly all these species produce very valuable wood, which is becoming scarce, and the demand for which is great. Despite the great value of the black walnut, hickory and beech for their wood product, I shall here discuss them from a standpoint of nut culture. Great quantities of wild nuts are gathered and brought in from the trees that grow in their native forests. At a Farmers' Institute in the southwestern part of the State, one man was reported to have sold $1500 worth of pecans from his woods in a single year. Including the oaks, the nut trees produce a very valuable "mast" for fattening hogs in autumn. In our own local market, the largest and finest hickory nuts I have ever seen were secured from the Perche bottom.*

With this natural adaptation to the production of edible nuts, there is no reason why Missouri farmers should not turn their attention to fostering the growth and development of the wild nut trees, and in some cases, to the planting and cultivation of nut plantations. Perhaps the reason that so little attention has been given to nut culture in the past is because of the bountiful supply of wild nuts. Our best wild nut trees, however, are very rapidly disappearing. An examination of the cord wood brought into town shows that large numbers of magnificent trunks of walnuts and hickories are every year cut down and split up for fuel. This is in part due to the clearing of the land for agricultural purposes. Many species of the nut trees are indiginous to rich soils, so naturally those soils which grow abundant nut trees are often selected for farm tillage.

It is a well-known fact that certain trees produce better nuts than other trees of the same species. This autumn we have been selecting nuts of various kinds for planting at the Experiment Station. The pecans show a great difference in shape, quality of meat and thickness of the shell. Some are very short and hard, others very long, slender and soft-shelled. Even greater variation is noticed in the white hickories brought into town. In this immediate vicinity we get variations from very small nuts up to the largest I have ever seen. This variation is sometimes caused by the trees growing in different kinds of soil. Those growing in the rich lands near the stream generally produce the largest nuts, and yet trees in similar soil and apparently equally nourished produce nuts of different quality. From Shannon county a sample of pignuts was obtained that had a sweet edible nut and very

*A small stream in Boone county.

soft-shell. These nuts are usually too bitter to be edible. From Southwest Missouri we obtained samples of very large, fine nuts that are undoubtedly a hybrid between the white hickory and the pecan. It is our aim to select the best nuts that we can find of the various varieties, and see what improvement can be made in them on the horticultural grounds.

This variation in the different species is the main reliance of the horticulturist in affecting improvement. It says to us as plainly as nature's words can say, that careful selection, cultivation, possible cross fertilization and judicious management will occasionally secure specimens that are very much superior to the average wild type.

Despite the fact that in many localities the native forest trees are our main reliance for a nut supply, enough has been done in this country and in Europe by way of cultivation and improvement of the nut trees to show that they respond to good horticultural management, just as our orchard fruits or berries do. Mr. L. A. Goodman, Secretary of our State Horticultural Society, has a grove of chestnut trees near his home at Westport which is a splendid example of what can be done with nut trees in this State. Under his skillful management they have made a uniform and symmetrical development, which shows what an orchard can be made of nut trees. Briefly stated, the culture of pecans in the South and in California, the culture of the chestnut in this country and Europe, and particularly the culture of the English walnuts and filberts, has not only shown that superior varieties can be originated and propagated, but that the selection of the proper stocks upon which to bud and graft, and the adoption of proper methods of management bear the same relation to profitable nut culture that similar practices do the profitable growing of other fruits. We have reason to expect, then, that some of our finest types of wild nuts may be propagated and perpetuated during succeeding generations, just as fine varieties of apples are handed down as legacies to be perpetuated and improved.

Aside from the cultivation of nut orchards there is another phase of nut culture which I deem worthy the consideration of farmers in the river counties of Missouri, and where bluffy and so-called "waste lands" occur. Along our rivers and smaller streams there are numerous bluffs and rugged slopes too steep and stony for farm tillage. In many cases these slopes produce several species of nut trees, and on many other such tracts the growth of "mast" and valuable nuts might be encouraged and fostered by artificial planting, and the gradual replacing of worthless "brush" by valuable nut-bearing species. I have in mind various small tracts along the Hinkston creek in this county,

where small, irregular strips of bottom land within the loops of the winding stream might be planted to walnuts and hickory nuts. A little higher up the bluff chestnuts and even pecans would succeed, while even the most rugged part of the cliff would produce hazelnuts wherever good soil could be found among the rocks. This sort of planting might be effected with very little expense and no cultivation of the soil.

Aside from the value of the nuts, which at first might be small, other benefits might be derived. The value of the wood, wherever the walnut, hickory or pecan could find congenial foothold, would eventually amount to a good deal. The natural beauty of these rugged bluffs would be preserved. The nut trees are soil-improving and would enrich, make and hold the soil along these rugged slopes instead of permitting it to wash away as it does from all such hillsides as soon as they are denuded of their cover of trees.

By this means many valueless tracts of land might be made useful and valuable. Every year large sums of money are sent out of the State to supply our local markets with nuts. This expenditure might be for the most part saved by utilizing our waste lands for nut growing. At present we have within our borders fine types of our native nuts. Now is the time to begin selecting varieties for cultivation and improvement before the best of these wild types shall have been cut down.

INDUSTRIAL EDUCATION.

By Dr. R. H. Jesse.

Rational education involves the training of the mental, moral and industrial powers. The training of the intellect alone is not sufficient. Combined with moral weakness, mental strength may give dexterity in wickedness; combined with a lack of industrial power, it may lead to brilliant worthlessness. Without the guidance of the intellect, industry is fruitless; without the uplifting of morality, it may be pernicious. No education is sound that does not cultivate simultaneously the intellectual, the moral and the industrial powers.

It must not be forgotten that our public schools have done and are doing much to train the moral and industrial faculties, as well as the intellectual. Because the Bible is not read and devotional exercises are not held, and books on ethics are not studied, it should not be inferred that these schools do nothing for moral training, or nothing for industrial because they do not teach handicrafts.

In enforcing punctuality, regularity, order, silence, the daily performance of allotted tasks, and the facing of responsibility consequent upon neglect or evil conduct, the public schools are fostering the very roots of morality and of industrious habit. Every teacher whose head is full of intelligence and whose life is guided by an enlightened sense of duty is exerting upon the young, even though there is no Bible reading or prayers, and no direct teaching of ethics or of handicraft, a powerful influence for good morals and industrious habits. It would be difficult to conceive of this triple training in better form than is found in some of those institutions that, planned in heaven, are known on earth as kindergartens. Indeed, if there be due care in the selection of teachers, our whole public school system, though it aims primarily to train the intellectual, does necessarily train the moral and industrial powers also.

But the question arises whether additional good would not come from a direct aim to teach good morals and industries. Admitting as I do that our schools are already fostering the roots of moral and of industrious habits, the fact remains that this is done without direct conscious aim in the system, and that much might be gained by the introduction of such aim. In the district schools in the long stretch of eight years, we might surely find time for teaching something about the greater relations of life. It should not be assumed that knowledge of these comes by institution or even by attrition. It is possible to give by text-book, orally or otherwise, valuable instruction in the reciprocal duties of parent and child, teacher and pupil, husband and wife, employer and employee, corporation and general public, citizens and community and state and nation, and so on. Doubtless some of this instruction is given in what is called civil government and in other ways, but in my opinion, there is need of the direct conscious teaching of these things. To some of us at least they seem quite as important for mind and morals as much that goes under the name of geography, arithmetic and grammar.

I see no reason, also, why every school in the country, at least, and in the smaller towns, might not have by it for a garden an acre of ground. In course of time we would learn to give in such gardens out-door laboratory work in horticulture and botany. The value of such training would be inestimable. With rapid transit our cities are constantly spreading in area and becoming, as it were, ruralized. In the near future the metropolis will have a commercial center where business is transacted in sky-piercing buildings and the minimum of space, and beyond this suburbs stretching thirty, forty or fifty miles into the country. In these suburbs the people, rich and poor, will

have their homes in houses, great or small, each of its separate plat of ground. From a public point of view it would then be invaluable for the people to know the possibilities for fruit and flowers of a small front yard, and of a small back yard for vegetables. Where a furnace can be afforded a little forcing bed covered with glass can be made to work miracles, almost, in early vegetables. Such people would find it a blessing to know something also of dairying or poultry raising.

Nor would this interfere with professional market gardening, dairying or poultry raising, but would rather promote them. Perhaps the most serious obstacle now in the way of these occupations is that the American people have not yet learned to eat sufficiently of fruits and vegetables, or of eggs, poultry and dairy products. It would be found, I think, that with a little garden and a cow and chickens at home, economy would induce at certain seasons new habits of eating, and at other seasons the new habits would lead to the expenditure for fruit and vegetables, poultry and dairy products of some of the money that now is expended for bacon. The awakening of general interest in these occupations could not possibly result in loss to those who pursue them as a business.

No reason appears why we should not strive to reduce to pedagogical form the teaching of these things in rural schools. If the district school course does not permit of it, this teaching might be restricted to the high schools, where the number of pupils is smaller and the chance for education is better.

In city schools, why should not handicrafts adapted to the age and strength of the pupils be taught? I have seen the experiment tried for years in a high school maintained by the Tulane University in New Orleans, and again with older pupils at the University of Missouri. From four to six hours a week for a period of nine months produces creditable skill in the use of wood-working or iron-working tools. Usually an average of five hours a week for two years will make a boy a fair mechanic in wood and in metal, and moreover will develop quite as much his muscles as the same time spent in a gymnasium. We cannot find that it subtracts at all from scholastic performance. Indeed, in view of the physical exercise and of the sharpening of the mental faculties, the time consumed may fairly be counted as contributing to scholarship. No one, so far as I know, has ever given manual training a fair trial without coming to this conclusion. This instruction, moreover, has been reduced to excellent pedagogical form.

It must not be imagined that I am for turning everything into trades schools, but it does seem to me that in the country the course

of study might be brought closer to the larger occupations of the country, and in the cities to handicrafts. Where the country schools can add handicrafts also, or the city schools horticulture and botany, the blessings would be still further increased. Such additions would not subtract perceptibly, I believe, from the present performance of these schools. Where an addition to the school program consumes but little time and brings healthful exercise and mental diversion, it cannot be said to really diminish the time available for other things.

If such industrial training were added to our high schools they would prepare students not only for literary colleges, but also for those of agriculture and mechanic arts. The education that these institutions were established to give is essentially but broadly industrial. In the measure of success that they have achieved they vary greatly, but enough has been accomplished to show how valuable they are and how great is the possibility of their future development. But they cannot achieve full success until they are recognized in the state system of education. At present they stand alone, getting little recognition from schools above or below. No high school in Missouri, or so far as I know in any other state, aims to prepare students for a college of agriculture and mechanic arts. This ought not to be.

It would be eminently wise for any state, and especially for one so intensely agricultural as our own to offer, say $1000 a year, to help one high school in each Congressional district to teach agriculture, horticulture and mechanic arts. Of course, in choosing the school in any district some attention would be paid to the amount of bonus which the citizens of the different towns would offer. With a course four years long it would be possible to give good instruction in agriculture, horticulture and mechanic arts, as well as in the other branches that are now taught. Ninety per cent of the pupils in our high schools after graduating go into business, and only about 10 per cent go to college. The 90 per cent from these State schools would be greatly aided in practical farming, and the 10 per cent would come generally to the A. and M. College for training in scientific agriculture. In view of what the farmers contribute to the wealth of Missouri they have an abundant right to demand this instruction. It would cost only $15,000 a year, and need not last more than six years. The expenditure for this purpose of $90,000 in a period of six years would work wonders in the secondary school system of the State. Progressive institutions of their own accord, without State aid, would follow the good example, and in 10 years there would be 50 instead of 15 such high schools. Then our College of Agriculture and Mechanic Arts would be full of students well prepared.

These colleges are beset by many difficulties. One arises out of the fact that they must attempt simultaneously the training of farmers for the farm where there is danger in giving either too much or too little and the training of scientific agriculturists where the smallness of the numbers brings the teaching into popular contempt. To maintain their numbers most of these colleges where they are not united to universities, have taken in a variety of subjects that have nothing especially to do with agriculture or mechanic arts. Where they are united to universities they are unable to do this, but consequently their numbers are small. Hence the popular impression is that those on separate foundations have been more successful. They have indeed secured large numbers, but not of students studying agriculture or mechanic arts. On the whole it seems to me thus far the colleges connected with universities have been rather more successful.

Another difficulty arises out of the immense range of investigation and instruction assigned to these institutions, and the difficulty of reducing some of the instruction to pedigogical form. They embrace the range of experiment station work and of instruction in agriculture, horticulture, animal husbandry, domestic economy, mechanic arts and engineering. Some of these subjects have and some have not been reduced to pedagogical form. While every year marks progress it cannot be said that we have yet learned to teach really well agriculture, horticulture or animal husbandry. The other three subjects, domestic economy, menhanic arts and engineering, have been reduced to pedagogical form—engineering long ago, mechanic arts within the last fifteen years and domestic economy within the last five. Fortunately the experiment station work pertains to subjects in which instruction is most difficult in agriculture, horticulture and animal husbandry. In these subjects the station work is much less difficult than the teaching, and is immediately helpful to the farmers. It is possible, therefore, through this means to help the people materially, while we are slowly learning how to teach these subjects.

Let me say here in brief digression, that largely through the investigations of these stations our intelligent dairymen know precisely what dietary and what method of feeding will get from their cows the best results in milk, or butter, or beef. This leads us to hope that some day similar knowledge may be attained for mothers of nursing infants. Thanks to these stations our intelligent breeders and farmers also know precisely what dietary and what method of feeding will produce in pigs the best results in bone, or muscle, or fat, or growth. This leads us to hope that ere long parents and teachers may understand equally well our school boys.

But returning to the subject let me say that in our own college we are doing what we can with greater effort at some points and less at others, but with some effort along the whole line of college and station work with the single exception of domestic economy. On this subject, because of its importance, I desire to talk a little just here.

Nothing on the farm is half so important to the farmer as his wife. If she manages well, prosperity is possible for him; unless she does, it is impossible. The colleges of agriculture and mechanic arts should train women to help their husbands and train husbands to help their wives aright. Many women bear burdens that cry aloud for relief. With poor help at best and often with none at all, they are, on the farm, usually responsible for the cooking, washing, nursing, mending, dairy work, gardening and poultry. Moreover few houses are properly supplied with labor-saving machinery. Schools of domestic economy should teach women how to manage their households, so as to get the best results out of a given amount of money; how to make home as agreeable as possible to husband and children; how to do the necessary work with the least amount of labor; what labor saving appliances to use, and how to get them from their husbands.

No class of people in America furnishes as many inmates to the insane anylums as farmers' wives. This is attributable to the fact that largely without rest or recreation they work 7 days in the week, and 52 weeks in the year. Their burden is heavier because perhaps 990 out of every 1000 do not understand what could be learned in any good school of domestic economy. No sensible woman ought now to consent to marry a man until he has saved money enough to supply their home with proper labor-saving machinery. No farmer would dare now to mow hay with a scythe, or to cut wheat with a cradle, but their wives are using appliances that are quite as antiquated. With an abundant supply of hot and cold water in the kitchen, with faucets close to the stove and right over the sink, with pantry and shelves so arranged as to reduce walking to a minimum, with plenty of utensils and appliances for quick work, with the right kind of stove and a quarantine against hot bread and a woman that understands how to do it, cooking need not be irksome. It is part of the work of a school of domestic economy to teach women how to cook both easily and well. Another function of these schools is to teach what, under fair division, when help is scarce, is a woman's share of work on a farm. If the teaching be enlightened, it will show that wherever there are small children and no help the man should care for the garden and milk the cows, and that if it be possible the washing should be done at the laundry. But schools of domestic economy should fit women

not only to meet poverty, but also to grace wealth. Some farmers are well to do and wish to have their households so managed as to gratify their pride.

Moreover the instruction should not be confined to cooking alone, but should extend to the range of good management. It involves necessarily the furnishing and adornment of the home, wealthy or poor; the cutting, fitting and trimming of garments; the keeping of household accounts; the use of labor-saving appliances, and the best methods in every division of household work. The poor and rich alike should join in demanding that at the earliest possible moment our College of Agriculture add this invaluable instruction. In my opinion the work should begin not later than the fall of 1896.

But when we go beyond the colleges to the university we find in industrial or professional training great deficiency. Is there any reason why they should not prepare men for commerce, transportation, civil service (state, municipal and national), journalism, manufactures, and indeed for every one of the larger industries of life? If a merchant, for example, wishing his son to succeed to his business sends him to a university, the result may or may not be a good education. So much depends upon the young man's ability and application that this uncertainty cannot be helped. But if he gets a liberal education he will rarely succeed his father in business; and if after leaving the university he is willing to take the business, it means ordinarily that he has failed to get a university education. The same difficulty in the education of his sons confronts the manufacturer, the railroad man, the journalist, and so on. In other words, our universities give only those forms of education that wean young men away from well nigh all the occupations of life except law, medicine and engineering. Now the merchant has a right to demand that the university provide such courses of study that his son may receive a liberal education and still be kept in sympathy with commerce. The railroad man, the manufacturer, the journalist, the banker and the aspirant for position in civil service, and so on, have a right to expect similar provisions.

The defence is often advanced that it is not possible for universities to train men for such occupations; that the only way to master these is to engage in them. The same was once said of law and of medicine, and still more recently of engineering, of agriculture and of mechanic arts. But all of these subjects have been reduced to good pedigogical form and are now being taught by most of our universities. It is equally possible to train men for any other larger occupation in life. One difficulty is that we do not think of the same grade of preperation in all of these things. When we talk of training a man for the

bar everybody knows that this will not make him a fine lawyer; that to the foundation gained in the law school experience must be added. So also for medicine and for engineering. The university gives a liberal education with sufficient training in engineering to keep the student full of enthusiasm for his future profession. Every one recognizes that he must still make his way slowly and that only by adding to his training long experience can he rise to distinction. But when we speak of educating a man to be a merchant, or a journalist, or for railroad service, or manufacturing, people scoff because they imagine that the education aims at more than it does. It is perfectly possible for a university to give men liberal educations along lines that will keep them at least in thorough sympathy with any of these occupations and that will give them as a basis valuable technical training. Experience must finish the work. But because of their university education such men having better foundation will work up far more rapidly and far more surely. Their chance of success will be greatly increased.

Would to God that the Legislature would give our University means sufficient to enable it to give all this instruction and thus to help forward all the people of every class and of every occupation.

INDUSTRIAL EDUCATION.

Address delivered before the Farmers' Institute at Sarcoxie, Mo., Nov. 14, 1895, by Hon. John R. Kirk, State Superintendent of Public Schools.

Some people wonder why a schoolmaster should address a Farmers' Institute. They say: "What does a schoolmaster know that can possibly entertain or benefit farmers, their wives, or sons or daughters?" Even on the road to this meeting I was accosted by a farmer friend of mine who spoke to me in substance these words: "Well, Mr. Kirk, you are a pretty good school man—you understand Latin, mathematics and science, no doubt, but it is precious little you know about raising hogs, cattle and corn. You can do well enough in a School-teachers' Institute, but if you have the idea in your head that you can instruct those farmers, you had better let the job out."

Nevertheless, my friends, here I am. And let me tell you about that man, that farmer who did not want me to come here and speak to you. I drove past his farm. He has a good farm. He wants to make it better, but doesn't know how. He has a fine farm house and a large barn with bright red stripes running up and down the sides. He has a big orchard, the older trees bearing runty apples and gradually dying out because he does not know how to protect his orchard.

In the garden I saw a few lonely gooseberry and current bushes. Down in front of the barn is a great pond four or five rods wide and several feet deep; into this pond the barn lot drains. The rain falls and washes through the barn lot and down through the hog lot and the sheds back of the barn where the cattle stand. All of the drainage, much of the richness of the barn lot, is washed down into that pond. The water of that pond is filtered through manure piles. Ah, my friends, that is a rich pond, rich in the earthly treasures that should be kept in heaps for distribution on the farm to renew and increase its fertility. But where does the richness that washes into that pond go? I will tell you: The horses and mules drink it; the Jersey cows drink it. The cows drink from that pond at noontime; the farmer's son and daughter milk those cows at sunset. As the children flock around their mother while she is straining the milk they drink of the milk, again they drink it for breakfast. Morning, noon and night the family fill their stomachs with the filtered liquid of the barn lot. You know what that means. You know and every one who reads knows the effect of using the milk of cows that drink foul water, yet this man thinks the schoolmaster has nothing of value that may be spoken to farmers. I am pretty well acquainted with nearly every county in this great commonwealth, this keystone State of the Union, this glorious Missouri; and I am sorry to have to confess that nearly one-half of all the artificial ponds on the soil of this State are filled with the drainage of the barn lot. What does this mean? I am told it means five per cent loss to every cow and horse that must drink filth instead of pure water. And I am prepared to believe it. What more does it mean? Something of vastly greater significance. It means malaria, ague, typhoid fever, nausea, feebleness, "grippe," sallow complexion and a lack of stamina in sons and daughters, old men and matrons.

Let me tell you a story. I was a farm boy. For twenty years I knew three families living on adjoining farms. In the first were sons and daughters. For many years this family used water for drinking and kitchen purposes drawn from a "living well" at the junction of two sloughs that drained the stables and barns and fodder pens. It was a "living well" made such by the drainage from the barn lots. For many years the members of this family were afflicted with fevers, headache, neuralgia and disorders of the stomach and bowels.

On the second farm were a good farm-house, barn and orchard, meadows, rich corn fields, fine stock; on the hillside just above the house was a luxuriant garden; in it were raised choice cabbages, melons, citrons, strawberries, potatoes and other garden products.

Just below the house was the well. Do you see the picture? The rich garden just above the house, the land sloping gently, hard-pan clay subsoil just beneath the surface? Do you know where the drainage from that garden went? Do you know where the drainage from the cellar went? Into the well—*into the well*, my friends, and year by year that family had sour stomachs and headaches and fevers.

But let me tell you about farm-house number three. It stood on the hill top. Near the house was an old-fashioned well fifty feet deep. It had the old-fashioned windlass and

> The old oaken bucket,
> The iron bound bucket,
> The moss covered bucket,
> That hung in the well.

Away down beyond the house and several feet lower than the house were the barn and the hog pens and the cow lots. From the house and the well the drainage flowed in opposite directions. Wet weather did not affect that well. No drainage from the cow lots ever reached that well. And during a period of 20 years that family had no fever, no ague, no chills, no neuralgia, no stomach disorders; or if they did, the neighbors never knew it.

I believe in the purposes of this meeting. I am glad to see this magnificent audience. These meetings augur better days for the farmer and his family and for all mankind. We can raise higher grade cattle and horses, more sheep and poultry, better wheat, corn and fruit. In this land of the big red apple, this land of blue grass and vineyards and cornfields, we ought to make our farms and orchards and gardens the richest on the continent. And we can. But better than orchards richly laden with fruit or fields of golden grain, or meadows green, or gardens luxuriant—better than all these things are strong, stalwart, handsome, healthy, buoyant men and women—full of hope and promise and kindness and good cheer.

Increase the yield of farm and orchard and garden? Certainly. Increase all these things? What for? To better feed and clothe and house the farmer's wife, himself, his sons and daughters. Our increasing intelligence multiplies our wants. Hence, we must increase the yield to increase the comfort. Increase the yield to give the farmer better health, feed him better, clothe him better and give him a better bed, more books to read, more culture and refinement—a happier soul and a lighter heart. Raise better beef cattle? Why? To fill the farmer's stomach with good rich juicy beef steak instead of drenching him with patent medicines and other physic. We want the means of better living.

Talk about comfort and health. If good feed, shelter and water are necessary for the growth and fattening of the stock on the farm, what must be the effect of these things upon the man who runs the farm? Look at your country school-houses. I once taught a rural school of twenty-three children. All through the winter months those children huddled round a big four-legged, red-sided, grinning stove in the dead center of the school-room. Through cracks in the floor the cold north wind whistled. Around the doors and windows the wind and rain beat in. Daylight entered through ceiling and roof. How I fed cord-wood into that old stove. And how that old grinning, fiery-mouthed dragon did crackle and splutter and quiver and smoke. How the children sat and roasted their faces and baked their brains while their feet were freezing and their legs were chilled. I knew no better, the school directors knew no better, the people knew no better. Fifty dollars would have made that school-house comfortable, but no one knew enough to have it done. In the years that have flown I have read the obituaries of five of my former pupils in that little school of twenty-three. When I knew them they were healthy, strong and robust. But how they did sneeze and cough and wheeze and shiver in that old box-car we called the school-house. There are yet in the land thousands of such school-houses where the farmers' children go. You will find them, some of them, over in Kansas, Arkansas and Illinois.

You have listened to the addresses of these scholarly scientists from the University, and these other men employed by the State Board of Agriculture, these skilled specialists in sheep-raising, fruit-raising and dairying. They are showing you how to provide for the health and growth of your live-stock, how to increase the yield of meadow and cornfield and orchard and milk cow. These men know something. They are prying further every year into nature's secrets. What they found out we all want to know, if we can.

I know the farmers well. I was one of them for 22 years. I still delight in having the finest garden in town; and my hens (I mean my wife's hens) lay eggs all winter. This is because we know what to feed hens, and how to take care of them. I know pretty well what farmers think. They often get gulled by patent rights and patent medicines. In some things they are over-confiding; but as to the results of scientific farming they are far, far too incredulous. This is gospel truth. A majority of Missouri farmers this very hour look upon this series of Farmers' Institutes with incredulity and distrust.

Yet the only hope for farms and farming now and hereafter is in the application of actual science. The chemist, the botanist and the

entomologist must rescue farming and horticulture and stock-raising. There is no other relief. Let those doubt who will, and doubting suffer longer.

The Missouri of today is not the Missouri of two generations ago. Our grandfathers came West and grew up with the country. They settled on the high prairie, down on the bottom lands, on the hill tops and in the woodland. The wild forests rang with the sound of their axes. Brave men they were and well their work was done. Their difficulties were great enough for them, but not equal to those which confront the young man of today. All the rugged health and unflinching courage and unwearying perseverance of the pioneer is needed to run the farms of Missouri today. All these things? Yes, and many more.

The young man of 22 or 25 starts out today from his father's roof, but no wild and untilled west awaits his coming. When he leaves his father's threshold he lands in the street. Opposite his father's farm is another farm. Down the lane from his father's farm, toward the village, he beholds farms, gardens and orchards on either side. He takes the train for a western town, and finds the lands in possession of those who have gone before him. And the young man returns to his father's roof. He must now cast about him. He must learn to do the world's work. He must earn the money to buy him a home. He must purchase the land which has already been tilled. He must know what has been done with it and what can be done with it. A man can no more run a modern high-grade farm without a knowledge of soils, and subsoils, and minerals, and rotation of crops, and scientific breeding than he can run a locomotive without the engineer's skill, or a flouring mill without the miller's art.

What, then, is this knowledge which the modern farmer must have? He must know the chemistry of the farm. He must know the life and the constitution of the things that grow from the soil of the farm. He must know their mode of growth. He must know the insect life of the locality in which he lives. He must be a constant and successful student of botany and zoology, especially that branch of zoology which deals with minute animal life—entomoloy. This he must know and know well. He must know the friends and enemies of the apple tree, of the cabbage, of the grasses in the meadow. He must know about the millions of living things that creep and run and fly.

But how can the farmer learn these things and thereby keep his land from wearing out and thereby save his crops from destruction.

By the discussion of free coinage? Hardly. By debating on free trade? I guess not. By trying to discover whether a tariff on imports

is a tax on farmers? I'll tell you of a tariff that is a tax on farmers: it is the tariff annually levied by apple tree borers and moths, cabbage worms and potato bugs, chinch bugs, grub worms and caterpillars. Here is your field for investigation. Myriads of noxious insects daily challenge the farmer to deadly combat. It is a battle to the death. It is close at hand.

The young farmer and the old farmer must know the science of physical life. They must know the life of the animal and the plant, but where can the old man or the young man go to learn these things now?

There is in our magnificent University at Columbia an entire department admirably equipped and given over exclusively to the study and demonstration of those facts which must be known to make successful farming in Missouri possible. Thousands of dollars are invested in the agricultural school of the University. There are long courses connected with the other scientific departments of the University and there are short winter terms. I often wonder why many practical farmers do not take advantage of the two, three or more months of the winter season and go down to Columbia and take the short courses in agriculture, horticulture and dairying. Most of the other professions do such things. You hear of the doctors nearly every year going to St. Louis, Chicago or Philadelphia to take courses in the recent developments of medical science. These men drop their actual practice for a month, two months or three months and go to the great colleges and universities where the needed information can be had.

We must away with the notion that the farmer is or can be an ignorant man. It is true, in the earlier day men of dull brain and little knowledge sometimes settled where the land was rich and by grasping everything near them and by greed and selfishness grew rich by holding to everything they got and spending nothing. Here and there we still find rich old fellows who have grown rich in spite of themselves. Some of them bought land at a low price in an early day, rich land close to the market, and held to it until it made them rich. But what does all this mean? Are they valuable citizens? Is their influence helpful to you and me? They have simply stuck in a crevice of the earth like a stone in a wagon track, and soil and riches have washed up against them, not because of their good judgment and safe calculation, but in spite their stolidity.

But the day has passed for things like these. Today and tomorrow the farmer must think his way to prosperity. The successful farmer is and must be a man of brains, a man who calculates, a man who thinks for himself, a man who reads books and understand them.

The successful farmer, horticulturist and dairyman must be educated for their business just as the lawyer and the doctor and the school teacher must be educated for their professions. What does this mean? I will tell you what it means. It means that we must commence in the little school house that dots the prairie or nestles in the glen. In our geographies we must have less about the length of the rivers and the height of the mountains in Africa; less about the deltas of northern Siberia; less about the Hoang Ho and more about the Chariton and the Gasconade; less about the inhabitants of Arabia and more about the population of Missouri apple orchards and wheat fields. We ought to teach the elements of agriculture to the boys who attend the country schools in Missouri, and we are going to do it before long.

How delighted the boys and girls will be to learn about the wheat and corn; how delighted to learn about the apple trees and the pear trees and plum trees and peach trees; how these trees grow and are propagated; how they may be cared for and protected from the enemies that annually destroy them. Only think of the innumerable inviting facts, knowledge of the things lying in the pathway of boy and girl on the way to and from school that they ought to know and can be taught.

I am for banishing a large part of the trash that is inserted in our great big costly text-books on Geography. In place of these things we must and will soon insert and teach facts about the earth in the neighborhood where we live. Already in the cities things like these are being done for the prospective blacksmiths, carpenters, architects, engineers and men of affairs. Hundreds of the High School boys and girls in the cities and towns at this time are studying the very science which the farmer's boy should know, science not taught from books but in the actual laboratory, where the electrical machine is made by the hands of the student, where the chemical forces are discovered by the experiments of the student, where the potato bug, the chinch bug, the grasshopper and the beetle are inspected, examined, studied and classified. What then is the duty of the hour? It is to turn our eyes in the direction of the new things and the true things that we must know and do.

Educate the Doctor? Every one says educate the doctor, that he may keep us from getting sick and teach us to be strong in body and limb. Educate the Lawyer? Undoubtedly, that he may do our business in legal form and keep us out of litigation. Educate the School Master? Certainly, that he may guard, guide, awaken and properly start on life's intellectual pathway the Missourian of tomorrow. Educate the Preacher? Certainly, certainly, that he may be a grand

full-rounded soul abounding in sympathy and kindness and wisdom and hope, so that he may make men's burdens lighter and their lives better. Educate the Farmer? By all means educate the farmer that he may fill the earth with plenty, enjoy the fruits of his own willing labor, and make the hearts of all men glad. And that is what we are going to do.

TEACHING AGRICULTURE IN THE COMMON SCHOOLS.

By A. H. Fuson.

Mr. Chairman and Gentlemen of the Farmers' Institute: I have long been proud to be a citizen of Laclede county, Mo., for I believe that in many respects it is the most highly favored spot with which I am acquainted; but today as I stand here and look to the right and left at the magnificent display of products of the farm, orchard and dairy, I am more than ever before proud of our grand county of Laclede.

I would not, however, underestimate or speak lightly of any other portion of the State, for in a general way I am proud that my home is in the future great State of the Union. But enough of this, as my time is limited by a full program.

I have been invited by the Secretary of the State Board of Agriculture to address this meeting upon some question on which I believe legislation (by the State Legislature) to be needed for the especial benefit of farmers. I accepted the invitation, therefore, am before you.

I am a practical farmer, not a farmer on paper, but a farmer in the field, holding with these hands the plow, the hoe and the scythe. Still I do not profess to be a model farmer, nor would I presume to advise a body of men like this in matters pertaining to their calling, but my limited experience as a legislator, together with my larger experience as a farmer, has caused my mind to dwell somewhat upon subjects indicated in the Secretry's invitation, and I wish to speak for a few moments along that line.

In looking over the field, my mind soon rested on the idea of teaching Agriculture and Horticulture in the common schools of our State.

We have in Missouri, as in other states, that which we call an Agricultural College and Experiment Station. In this State it is a branch of the State University, and is located at Columbia. It is supported by the General Government at a cost, I believe, of nearly forty thousand dollars a year. This institution, in my opinion, is of great benefit to the farmers of our State in more than one way, and when the improvements now being made are completed, it will doubtless be

much more so , and I would encourage all young farmers who can do so to go to Columbia and get full benefit of the opportunities it offers; but it is an unquestioned fact that there are hundreds, perhaps thousands of young men in our State who will become tillers of the soil, who would gladly avail themseves of its advantages, who are not, and will not be, financially able to leave their homes, and go their and pay their board and other necessary expenses incident to attending the college. This class would certainly be greatly benefited by some simple lessons in these sciences in the home school, and those who in after life may be able to get the advantages of the full course, would be advanced and benfited by having received this preparatory course in the common schools. You ask what is my plan? It is briefly this:

I would have a text-book prepared, perhaps under the supervision of the State Board of Agriculture. Its lessons would necessarily be brief, but should be simple and to the point.

I would have it contain some thoughts on the analysis of soils and of the crops to which they are best adapted.

I would also have it give some suggestions in regard to fertilizers (particularly those produced on the farm), how to save them, and how and when to apply to different crops in order that the best results may be realized.

I think that it should also contain some brief lessons in regard to at least a few of the most common of the insect pests which prey upon the fruits of man's labor, and the most approved methods of dealing with them.

Especially should it teach the proper rotation of crops in order to maintain, if not increase, the fertility of our soils. This subject is of the very first importance to farmers. The time is fast passing away, indeed, in many places in our State it is already passed, when we can occasionally clear and improve a piece of new land on which to grow the coarser crops. We must soon depend upon working year after year the same land for all we produce, and we cannot afford to exhaust the productiveness of our soil. Then our text-book should contain some pointed suggestions on this subject.

I would also have it teach some brief lessons in Horticulture. I think that it should give some suggestions in regard to the best soils and the best location for orchards and vineyards; something about grafting or budding, and planting trees and vines. Also of fertilizing, cultivating, pruning, spraying, etc. Also something of the insect and other enemies of the trees and fruits, and some brief points about picking and caring for fruits.

And if it would not make the book too large, I would have it contain a few points in dairying; something about the care of milk and cream, and of making good butter and cheese, that our daughters may be benefited as well as our sons.

This subject is the more important since the passage by the last Legislature of the "pure butter bill." The farmer's wife being relieved from competition with cheap and impure imitation of butter, may not only supply her own table, but may sell at a fair price any surplus products.

I believe that all the subjects named should be touched upon, and if handled briefly, would not, in my opinion, make a very large book. But I would not make the teaching of this to all scholars compulsory, but would have the law so framed that it should be taught only to those whose parents or guardians demand it. Then if I want it taught to my children I can have it so; and if my neighbor wishes his to give all their time to other studies, it can be as he desires. It may be objected that our teachers are not prepared to teach it, and would have to study it to qualify themselves. So much the better. The most of those who teach in common schools, especially those who teach in the rural districts, where this branch would likely be required to be taught, are themselves more or less interested in farming; many of them teaching in fall and winter months, and farming in summer; and a study of these lessons would be profitable to them and would in some measure at least, compensate them for the lack of such teaching in earlier life.

But, would it not cost something? Yes. What opportunities for advancement can we place before the young without some expenditure? The cost would not, I think, be very considerable, but were it much greater the money would doubtless be well spent. If the cost of carying into effect this scheme comes in part off those not directly interested in farming, we believe that it would do them no wrong, for all would be more or less benefited. It is a truism which we believe none will question, that whatever inures to the benefit of the farming class, indirecty benefits all legitimate calling.

We live in an age of advancement and development. All science and art are on the forward move. Progress is written everywhere, and the science of Agriculture and Horticulture should keep pace with the march of all else.

The next generation of farmers should be better prepared and equipped for their life work than the present one. It is desirable that our sons should know more than we and should get out of many of the old ruts in which we have run.

I would not, however, have them discard indiscriminately all old methods, for many of them are doubtless quite good; but I would have them qualified "to prove all things" and "to hold fast that which is good."

I do not know whether any State has a law similar to this. If so, let Missouri at once fall in line in this good work, and if not, then let our grand State at once move out on this line and set for others a worthy example. So without taking more of your precious time I will thank you for your very polite attention.

TEXAS FEVER—ITS CAUSE, DISTRIBUTION AND METHOD OF PREVENTION.

By Dr. T. J. Turner.

This disease being a specific malady is indigenous to certain portions of the United States. Being a disease which is contagious or infectious to animals outside of this portion, it becomes necessary that during certain seasons of the year certain restrictions be placed around animals which are shipped from this scheduled district. It is in reality a blood disease, due to a specific micro-organism which destroys the red blood corbuscles or nutrient carriers, thereby causing tissue degeneration from lack of nourishment, or starvation and death.

It is a well-established clinical fact that animals which are natives of this scheduled or infected country possess an immunity. And it is animals only which are located in a country which is not infected that succumb to it. There are certain other known clinical facts which also are of much interest, and which, although formely surrounded by much mystery, have been investigated in later years by the Federal Government and the mystery has been made plain. This disease, causing a descomposition of the blood, was for many years the cause of much surmise as to how it was communicated from animals brought from these southern or scheduled districts to animals in northern countries outside of this area. Various theories have been advanced and suggested. Some have been followed out extensively in experimentation; others have not yet been dealt with. Very few results of a satisfactory nature have been obtained with regard to the possible contaminating agent until within the last few years when experiment with the Texas tick (Bo-ophilus Bovis) have demonstrated beyond any question that this parasite at least in one way by which this disease is positively carried from the southern to the native animal.

The line which is defined annually by the Federal Government as the quarantine line, is laid out in accord with the existence permanently of these parasites in any particular location. The line as run this year will be found in the Secretary's report. Besides the Federal line each state is privileged, and in fact it is its' duty to pass a line of its own, which may, of course, correspond with that passed by the Federal Government; or to protect its own interests, it may run the line somewhat at varaince with that adopted by the Federal Government. The quarantine line of the State of Missouri this year did not agree with that adopted by the Federal Government on account of certain conditions which existed relative to this State in particular. For example, the Federal line excluded the counties of Jasper and Newton from the non-infected districts. Missouri authorities ran the State quarantine line along the western boundry of the State, leaving the counties of Jasper and Newton in the safe area. At the time that this line is adopted and the country scheduled thereby, it becomes necessary to adopt annually certain regulations concerning the transportation into and through this State of cattle coming from this infected territory. These rules and regulations will be found elswhere in the Secretary's report. In order that these rules be thoroughly enforced it becomes necessary to appoint deputies and inspectors who see that such are not violated. This year, in order to thoroughly sustain and enforce these regulations which were contained in the proclamation issued by the Governor, five inspectors were appointed. One located in Jasper and Newton counties, whose duty it was to inspect all cattle desiring shipment from these two counties to market. Also to see that there was no violation of the regulations by butchers or others desiring to obtain cattle from the Indian Territory to be driven into this State for butcher or other purposes. This becomes rather a laborous task when it is understood that from Joplin, Jasper county, to the Territory line there is very little but thickly wooded country. This work, however, as can be seen by a letter on file in this office from the Chief of the Bureau of the Animal Industry, has been carried on very satisfactorily during the last year. We have worked in co-operation with the Federal authorities in this matter of inspection and permitting, and have, by the kindness of this Department been enable to get all animals which were not infected with these parasites to go to the market, and on permit from our inspector, be placed in the native divisions of the stock yards at the various large markets. By this process, and the efficiency shown in the administration of the law, this State, it is hoped, will this year be able to get removed (if continued co-operation is had with the Federal Department) this

quarantine line from the counties of Jasper and Newton, running it around the State of Missouri, thus exclude this country from the infected area.

It is not necessary to go into detail concerning the *modus operandi* of this quarantine, as such will be observed in the regulations.

The duties of the inspector in Jasper and Newton counties were probably greater than those of any other inspector employed, as it required a great deal of tact and close attention to business to see that the work devolving upon him was properly done.

The duty of the inspector located at Kansas City was principally to keep note of all native cattle which came out of the Kansas City Stock Yards into the State of Missouri for feeding purposes. Such step might appear useless at first sight, but upon thinking more of the matter you will readily see that such steps might be of great benefit to the individual stock feeders and grazers of the State. In this way, if any animal purchased by them from a commission man at any of these large stock markets should, after he has been upon his farm for ten or fifteen days, become affected with this disease, Texas fever, the owner can trace directly this animal from its starting point to market, and possibly find out in what manner the animal became infected; and it may be that territory that is infected and has not before been known as infected, may be discovered. Such an example as this is the locality in and about Ventura, California. This, prior to 1894, was considered safe territory, and its cattle allowed anywhere at any time. There was an outbreak of Texas fever in this State in 1894, caused by cattle from this locality in California. Upon investigation it was found that this tick infected the territory in and about Ventura, and this country was consequently included in the infected area.

The inspectors in St. Joseph, Hannibal and St. Louis had the same duties as the one at Kansas City. Those in St. Joseph and Hannibal only making two trips weekly to the stock yards.

It may be interesting to mention somewhat in detail the life history of this tick. It is longer in body than the ordinary dog or wood tick; there is also the absence on the head of the white spot that is found on these two parasites. At the time of the complete development of this Texas tick there will be found yellow stripes down the back which are absent in the dog tick. The life history of the tick is something like this: After the eggs have been deposited on the ground under chunks of wood, leaves or similar material, they lie there, and according to the moisture, temperature, hatch at various periods. After having hatched from the egg they wait an opportunity to gain access to a passing animal. They crawl upon the blades of grass, and animals

walking over this grass shake them off. The minute parasites are not as large by one-third as the head of a pin. The parasites crawl between the hoofs of the feet of the animal, and in this way gain access also. After having gotten on the animal the parasite undergoes two moults and then begins to fully mature. The length of time required for these two moultings is about one month. At the expiration of this time the fully developed female loosens her hold and drops off among the grasses. Each female is capable of producing from fifteen hundred to two thousand eggs. It is supposed at the expiration of the second moulting of the tick that there is a regurgitation and the animal which is its host is at this period affected with the germ causing the fever, as it is frequently the case that animals may be sick from the fever and not a fully developed tick be found upon them. The only reason, and this is not yet definitely demonstrated, that one native animal sick of the fever is not capable of causing the disease in another native, is that the season required for the various changes of the tick to take place in its life history is too short and that cold weather sets in prior to the consumation of these various changes. The altitude has much to do with the permanent existence of this tick in a locality. High altitudes are detrimental to its welfare. Low lying countries are conducive to its permanent existence.

HOG CHOLERA AND SWINE PLAGUE.

By Dr. T. J. Turner.

It is from these two diseases annually that we lose probably more hogs than from all other diseases affecting swine together. But little progress has been made, although investigations have been carried on for the last few years endeavoring to find a definite cure for these maladies. In regard to these investigations, however, some facts have been ascertained which are of vital importance to swine breeders and raisers. One fact has been demonstrated beyond any question or doubt, namely, that hog cholera and swine plague, although very similar in the general results after once the animals are affected, are separate diseases caused by individual or specific parasites or micro-organisms which exist in the animal's economy; and that these two diseases are contagious and infectious also; that although they frequently exist concomitant at the same time. It is possible, however, for one herd of animals to be affected with hog cholera and the other with swine plague. As before indicated, the fatality is about equal in the herd no matter whether the herd is affected with swine plague or hog cholera.

The Department at Washington has carried on these investigations thoroughly, and there is no question as to the correctness of the conclusions so far as they have been reached by the Department.

These diseases, on account of the frequency of their appearance and also of the close amalgimation that exists between them in a neighborhood or community where either one disease or the other has made its appearance, shall allow us the privilege of using the two terms synonymously. In order to diagnose these diseases it becomes necessary first, that one be familiar with the various lesions that may appear, also of the forms which occur in the various animals in the same herd. For example, you will have in one animal the dermic form in which blood spots followed by sores and sloughs will appear on the hide of the animal. Again, the form in which the ailmentary tract will be invaded and lesions of the intestines will take place followed by hemorrhagic passages. Also, in connection with the dermic form we frequently have an affection manifesting itself in and about the hoofs of the hogs, probably the sloughing of the limb to the first joint. These symptoms, together with the inaptitude of the hog, an excessive amount of fever and the lack of inclination to eat will almost always be observed in hog cholera. Those animals which are affected with a cough and have lung lesions may be said, more technically speaking, to be affected with swine plague. However, as above mentioned, all of the symtoms are frequently observed in the same animal. The most accurate method, however, of positively diagnosing the trouble, one which cannot be questioned, will be the finding microscopically of the micro-organism, which is the immediate cause of one or both of these diseases.

The distribution of these diseases is very extensive throughout the State. In fact, I suppose there is hardly a county in its borders which is not affected in some portion of the year with this disease.

MODES OF INFECTION.

Being infectious it would probably be well to look to some extent into the mode and method in which this disease may be disseminated throughout the country, and to speak to some extent in regard to the probable precautions which should be taken in order to prevent the spread and further contamination of any locality when the disease has once made its appearance. One of the most prolific causes of this distribution are creeks, rivers, small springs, branches, etc. Another method is also the railroads of the country; then again the indiscriminate passage from the diseased lot to territory, not so affected, by individuals caring for the infected animals. Also, by dogs, cats,

and other animals of similar nature. Being, as these diseases are, due to specific micro-organisms living in the soil for a certain length of time it can be readily understood that streams running through infected lots would carry with them germs of this disease into neighboring lots and fields that were occupied by well hogs, which partaking of these germs, are infected with the disease. Also, should it be muddy weather the party taking care of the diseased hogs coming from the diseased lot will carry in the mud upon his boots the disease germs which are thereby scattered among healthy hogs. Anything, in fact, that would scatter the disease germs would be the means of disseminating the trouble. It is very easy to also understand how railroads scatter this disease, not only from one locality to another, but to other states. For example—I will say here, that although there is a law on the Statute books which prevents the shipment of cholera hogs to market, there is no one, nor body of men, to whom the power of enforcing such a law is given. It is simply on the statute books and remains a dead letter on account of this lack of execution—a lot of cholera hogs are shipped to market and unloaded in the pens set apart for the reception of hogs in the stock yards. They there remain until they are sold, either to the butcher, or if they are not dying too bad and escape notice of the inspector they are sold to some shipper or raiser who takes them to his own farm for feeding purposes. This latter, however, seldom occurs from the fact that the Federal inspectors keep a very close watch on all animals that come to market and those dying of cholera when they come to market are seldom allowed to get from under their direct observation, and are slaughtered and sent to the rendering vat. This I mention as simply a possible way that the disease might be carried from country to market and then from market again to another portion of the country. Another means, is by the cars in which the diseased animals are shipped to market, and also by the pens in which the diseased animals have been placed. The car in which the diseased animals have been shipped, after they have been unloaded at the stock yards, remains upon the track undisinfected, as there are no laws compelling such disinfection, and some shipper from the country goes into the market and buys a healthy lot of hogs. This same car is probably used by the railroad company to ship his animals to his farm in some locality of the State entirely foreign from that from which the diseased hogs came. After he has gotten his hogs home and they have been there ten or twelve days they begin to die of the cholera. He has not the slightest idea of how they became infected. Besides being contaminated by the car, these same hogs may have been placed in pens occupied previously by a lot of cholera hogs as the pens

in the stock yards occupied by these hogs are, as are the stock cars, not disinfected after the diseased animals have been removed from them.

Steps to be taken in order to prevent the spread of the disease:

First, after the disease has made its appearance in the herd the well animals should be moved immediately from those affected and placed in lots and pens situated on higher ground than that occupied by the diseased animals. There should be no drainage whatever from the infected lot to that occupied by the well animals. Also, the hogs should be divided in bunches according to the stages of the disease. This having been done, indiscriminate passage should be forbidden from the diseased lot to the lots occupied by the well hogs. The individual feeding the animals should be cautioned strictly in this respect. He should always feed the well animals first and go from them to the diseased lot and should there change his shoes in order that no contamination should be possible. The water supply to those animals should also be carefully watched after in order that no contamination should take place in this way, and also prevent the running over the place of individuals who have no interest in your welfare, and all such animals as cats, dogs, etc.

In regard to the medicinal agents which may be given as preventatives and curatives there are few that are of any consequence or avail. In the northwestern corner of this State this fall there appeared this disease to an alarming extent. Very great monetary loss was sustained by hog raisers, and as is natural in such cases, as drowning men grasp at straws, they grasped at almost any or all of these so called hog cures. It is needless to state the results of the administration of these medicines in the majority of these cases. Suffice it to say that the less one has to do with the majority of these so called cures the better they will be in the long run. There may be some virtue in some of them, as general tonics which keep the animal's system in as strong and vigorous a condition as possible. Probably in some of these preparations there is great advantage to be had in this way, but so far as their curative effects are concerned they are almost nil. The preparation which has been used quite extensively by the Federal Department in Washington, and one which of many has given the most satisfactory results, is as follows:

One pound each—Wood Charcoal, Sulphur, Sodium Sulphate, Antimony Sulphide.

Two pounds each—Sodium Chloride, Sodium Bi-Carbonate, Sodium Hypo-Sulphate.

These ingredients should be thoroughly pulverized and mixed. The dose of this mixture is a large tablespoonful to every 200 pounds of hogs once a day. It should be mixed with bran and then wet, making a soft bran mash.

This preparation has been used personally by me in one or two outbreaks and the results have been very satisfactory. In fact, some of the animals that had been sick, as has been indicated by the Department report, have been receiving the medicine, and by close observation of the directions for its administration, by good hygienic surroundings, have recovered from the disease. This preparation is kept constantly on hand by many hog dealers and is given to their animals, although the animals are in apparently perfect health. This is a very wise precaution on the part of the owner of the animals as by this he keeps them in a strong, vigorous condition. By so doing their system are kept in such a condition that they are able to combat the ill effects which might be caused by the taking into the system by the animals, any of the germs causing this disease.

It is a well known fact that all disease germs are extraneous or do not belong to the animal system, and that all health germs or cells which here go to make up the animal economy are diametrically opposed in their actions to any of these disease producing germs; consequently there is a continual warfare between the health germs and those producing disease. Bearing this in mind it can readily be understood that if the animals condition is kept such that it might be termed perfectly healthy, that the animal is in a strong vigorous condition, then these health cells will be able to outfight, so to speak, the disease germs which gain entrance to its system, and thereby the animal does not suffer from any disease caused by these germs.

To revert somewhat, I wish to speak concerning the idea held by many that hogs in the last year or so brought from drougth-stricken districts of Nebraska, Iowa and Kansas are prolific in producing this disease on farms which had possibly never been infected before or upon which the disease had not appeared for five or six years previous. Bearing in mind the foregoing, the conditions of the animals, their great emaciation and inability to combat any disease whatever, but rather being suitable soil for the growth of all germs, one can, without any imagination, realize how that these weakened, emaciated, depleted animals, coming in contact in any manner, either in stock yards, in stock cars or in contact with germs that may be lying dormant in a weakened condition, in soil upon farms which have not been infected, so far as the animals running upon them are concerned, with this disease for several years, would readily contract the disease, cause it

to exist in its most virulent form, and the animals not only succumb to the disease, but scatter it to all the strong, vigorous, and healthy animals which had been previously occupants of the same pens.

In considering the measures to be taken in order to prevent the spread of this disease, and prevent its occurrence upon a farm, two things are necessary: first and foremost is to have your animals located and this matter should be studied by every individual who cares to handle hogs under as favorable hygienic conditions as possible. They should not be allowed to lie around old straw stacks, or straw yards and breathe the impure odors and the dust which necessarily arise and accumulate around such places. Also the water used by the animals should be of a pure quality, just as that which is consumed by the owner. The food of the animals should be such as above mentioned, as would keep the animal in a strong, vigorous condition. One kind of food continually fed is not advised. Varied diet is much preferable. As to what this variation will be, must be decided by the individual owner or breeder. Besides the above mentioned preparation which has been used by the Department in Washington, there has also been used with beneficial results in many instances, crude petroleum in the following manner:

Divide the diseased hogs as follows: A, exposed and not yet diseased; B, slightly diseased; C, seriously diseased, and enter them in a book as such, with the signs and symptoms of the disease for each lot.

Give medicines as follows: Give enough to physic the hog thoroughly, say from one half a pint to a pint, followed every day by smaller doses. They will usually drink it readily from the trough, but, if they refuse to drink, it can be mixed with chop feed, or milk used as a drench. For drenching use a cow's horn if one can be had, or otherwise use a bottle with the bottom off and pour the oil in slowly with a tablespoon.

For a preventative give from ¼ to ½ pint two or three times a week while the hogs are exposed. In drenching a hog do not turn it on its back, by so doing you may strangle it.

I would advise this very strongly, as this oil is not only germicidal, but it also produces fat, keeps the animal's system in good condition, and after one or two doses they soon learn to like it.

Without going into detail concerning these two diseases, it might be well to look generally at the conditions of the hogs of this and also of other states in regard to their general health and their constitutions, and the probable cause of weaknesses if such really do exist.

Certain foods produce certain portions of the animal economy. It is a well known fact that the sole food of hogs in this western section of the country is corn. Hogs are fed upon corn as soon as they are able to eat and it is almost exclusively their diet until they are ready for shipment. Is this method of feeding capable of producing the best animal, one that is capable of withstanding the inroads of any of these disease germs after they have gained access to the system? Let us look into this and see whether we have as a class, animals that are capable of doing this. Corn, as just said, being the general article of diet of these animals, it can scarcely be the fact that they are as strong in certain portions of their economy as they should be. The reason is plain, when it is remembered that corn is almost exclusively a fat producing food. Very little muscle and bone is produced by this article, and the weakness in these parts is necessarily increased from generation to generation when the animals are fed exclusively on this diet. Besides the weakness in the lack of bone and muscle production, there are also weaknesses in the alimentary tract, which might be somewhat homely illustrated in the following manner: If an animal or individual is called upon to do a certain work in a certain way every day in the year, and only that particular work in the particular way, it is easy to understand that the portions of the body which are necessarily called into play in order that this particular work be done would be strengthened or weakened and that other portions of the body not called upon to do this work or any work, would be necessarily aenemic from the lack of use. This is the condition, so to speak, of the digestive apparatus of the animal that is fed exclusively upon one diet. That portion of the alimentary tract called upon continually to digest corn must necessarily, from the use to which it is put, the secretion of the digestive juices, causing overworked glands, and weakened condition of the same. Then a little failure in digestion might take on degeneration, and bad results would follow therefrom. Also those portions of the tract which are not called upon to do very much work in the way of digestion would become aenemic, weakened, and not capable of doing their legitimate amount of work. Consequently we have as a result of this continual feeding of one thing to animals, and a continual breeding of animals so bred, a class of hogs that are weakened to begin with. I suggest this idea for simply what it is worth. This may not in all instances be the case; but it seems to me that it would be well to consider this and that hog breeders and raisers should look further into the question than merely the producing of enormous weights and great quantities of fat. For it is worth as much to produce

an animal which is capable of withstanding the inroads of this disease, and this can be done, as it is to use brains, energy and money in trying to find a medicine that will cure the disease after it has made its appearance.

NECESSITY OF BARNS AND FIGHTING THE DIFFERENT KINDS OF WEEDS.

By John Patterson.

A very serious hindrance to real success in farming is the lack of goods barns to keep our feed and stock in. Some farmers have plenty of barns, but they are not used to shelter stock, except a few work horses, even in the worst weather. The young horses, cows and young cattle are allowed to run in the stock fields or wood pastures or meadows, or perhaps kept in small and very muddy lots around the barn. The result is a great loss of feed that will be more or less wasted, great discomfort to the stock and the loss of most all the fertilizers. Dairymen have found that cows must be kept in comfortable quarters to be profitable, so they provide good barns and mangers and stanchions, or some better fastening, that will allow each cow to eat in a separate stall. The dairyman who keeps up with his business will know what each cow eats and judge if he should feed more or less. This will satisfy both the dairyman and the cow, and under such an arrangement the fertilizers can be saved to put on the land. But to provide barns for other stock, clean the barns and keep the stock in stanchions, is thought to be too expensive and they are generally permitted to run at large as said above. But as we now know that cattle ought not to have horns, we also know that they need good tight barns or sheds with feeding places arranged on each side or through the middle in which you can place any kind of feed with little or no waste. Cattle can be let in here and, by putting some bedding in each day, kept fairly tidy, and all the fertilizers saved, both liquid and solid, until such time as the ground is in condition for hauling it and spreading it on the fields. If the stock are fed mostly on hay, the barn should be high enough to hold what would be needed; if corn fodder, a big shed must be provided that will hold a quantity sufficient to answer for such times as it cannot be hauled. There is considerable economy in running fodder through a cutter or shredder, as stock will eat nearly all and it is so much better to feed in barn. For milk cows and stock that are being fed for market it is much the best to leave the corn on the fodder and cut both together. The most economical way is to keep the corn in silos so that it will be ready for use winter or

summer, whenever needed. Many farmers think it too laborious and costly an undertaking to house and feed stock; but our former Dean, Prof. Sanborn, said a barn economically built and used would pay interest at the rate of 7 per cent, three times a year; first, in keeping feed free from damage and having it handy for use; second, in being more comfortable for the stock and more convenient for those handling them; third, in saving all the fertilizers to be put on the land and thus keep up and increase its producing power. With a good rotation of crops so as to have clover once in three or four and even six years, to be followed with corn, and in addition saving all fertilizers, as suggested above, the land would be continually made better and there would be no poor or abandoned farms as the present or old system will soon make.

Next, I wish to speak of the tremendous loss occasioned by letting so many noxious weeds take possession of the farms. The most common and worst weed is the cocklebur. It has gotten such a hold on many farms that the owners have giving up trying to fight it. They cultivate their corn and keep it fairly clean until time to lay it by and go to harvest. Then they let it alone and the burs grow so rapidly that they soon reach half the height of the corn and the seed or burs cause a condition too common to need be described. The remarkable thing about this is that the next farm, only on the other side of the fence, is often found to be entirely clean of them. The difference is *that* farmer has never given up fighting them and destroys one wherever he finds it on his land. But the imposition he suffers from his neighbor's carelessness is very great, for any rabbit, dog, or perhaps even bird, to say nothing of any stock that might accidentally get into his field, will bring with him the cocklebuns from the other field so that every year he has to renew the fight with the pests. But that is not the worst. When a man living near a stream allows these cocklebuns to grow on his farm, the burs fall to the ground during the fall and winter and the spring rise will bear them down on the clean fields of his neighbors by the wagon load. The farmer who wants to keep his field clean has to rake them out of the drifts where the high water deposits them and burn them before plowing is done, as they are generally left in piles. He can get most of them that way, but after harvest he has to go over all his field, take one, two or three rows at a time and cut them before they are ripe. He has to do all this on account of the carelessness of his neighbor. I confess I do not like such a neighbor. The writer has taken fields that were polluted with these nuisances and cleaned them by sowing them with small grain and grass seed. After the grain was harvested the burs would grow very

rank and I would then take a mowing machine and cut them as close to the ground as I could before their seed had matured sufficiently to grow and let them lie on the ground if the grass seed promised to make a fair stand. Then I would let the field remain in grass for two or three years and then plow it and plant it in corn. I would cultivate my corn well, then after harvest hoe three rows at a time, taking pains to cut every bur I could find. I never found many, but if that was neglected they would soon again completely cover the field.

I have listened with curiosity to farmers who were giving their reasons for letting cocklebuns grow. They will say they don't hurt the corn like grass or other weed, but I have observed fields in my own neighborhood and in traveling over the State where cockleburs were allowed to grow and found that they would not bear half the number of bushels of corn that the clean fields did, and the damage to the corn was very plain to any close observer. It is now known that one pound of weeds, dry weight, has taken out of the ground from 300 to 500 pounds of moisture and *that* often at the very time when the corn needed it most. As we find here and there farmers who are judicious and careful and persevering enough to keep their farms clean, I think it evident that all could do so, and I cannot keep from considering a man that farms on shares with cockleburs a disgrace to his calling, and like all other evil doers, he suffers a great deal from his wrong doing. Look at the miserable conditions! When he gathers his corn his stock are covered with burs. When he goes to town his bur-covered horses show plainly what sort of a farmer he is and he knows it is a sign indicating that he is a worthless farmer.

The north part of our State has another weed nearly as bad that which has taken possession of a great many fields and is very hard to eradicate. It is known as the cotton or butterprint weed. It has a broad pale green leaf, nearly like the catalpa tree, with a small yellow bloom that makes a pod very plentifully filled with seed. They only come from the seed and to get rid of them they must be cut before the seed are ripe and followed up as often as they come. I have seen perfect seed developed on plants four inches high as well as on those that were six feet high.

The south part of our State has a very bad weed known as Texas careless. It looks like a common careless weed but has thorns all over it like blackberry briers. This weed should be destroyed as soon as found. It first appears in vacant lots around railroad depots in towns but if not eradicated soon spreads rapidly to the farms.

The horse or bull nettle is one of the worst of weeds and great effort should be made to keep it from spreading as it will grow in

pastures, meadows and cultivated lands and is a very great nuisance in all places. Stock will not eat the grass close to these weeds for fear of their nettles, and they fear hay or straw for the same reason. It grows like potato vines and has blooms and balls like them and propagates itself from both roots and seeds.

A great portion of our State has a new sort of a thistle that comes in our pastures. It differs from the old kind that has always been here in being much coarser with long thorns that glisten in the sunshine like glass and if you touch them the pain seems to go through the whole body. They start from the seed the first year and spread themselves about two feet wide. The next year the stalk shoots out side branches the whole of its length, long near the ground and shorter near the top like a pyramid. They can be eradicated by cutting them any time between August and June the following year. If cut a little below the cluster of roots they will be killed. Some take them to be the Canada thistle but they differ from the Canada thistle very much, for if you cut the Canada thistle a new one will come from the end of every root where it is cut and it grows in plowed fields while this other thistle grows only in pastures and roadsides. We have a law on the Missouri statutes fixing a penalty of $10 for permitting them to grow, but I have not heard of the first one being indicted yet. I think the law should be enforced as the seed will fly a long distance, and if one tries to keep his land clean they will come from other farms where they are allowed to grow.

The Kansas sunflower has already spread over a large part of the State and it should not have been allowed to take possession of it.

Farmers ought to be on the watch for every species of noxious weeds that make their appearance and seek to take possession of our land. Assert your rights, and as long as we have our great Government deed to our land let us not take as partners any species of noxious weeds or farm on shares with them.

FARM SANITATION.

By Dr. Paul Schweitzer.

I am called upon to address you on farm sanitation—that is on matters of sanitary importance in and around the farmer's homestead. This is a large subject, indeed, and one which cannot be fully covered in the time at my disposal. If I succeed, therefore, in imparting to you some correct ideas regarding the proper mode of taking care of health and life, and thereby save you suffering and expense, incident

to disease, I shall consider my task accomplished. Let me remind you at the outset that the selection of such a subject for discussion at a Farmers' Institute means a conviction on our part of being able, in a measure, to control the outbreak of disease, and this being so, of the importance of communicating this knowledge to the farmers, who of all others suffer the greatest inconvenience and loss in spirit and money by sickness, since they live, as a rule, many miles from a doctor, and must largely depend upon their own resources in any emergency that may arise in their household.

Let me call your attention then to a class of diseases, commonly called infectious or contagious, and which in years now happily gone by have swept away from time to time at one fell stroke thousands and even hundreds of thousands of people, devastating whole countries, and bringing misery and desolation to untold firesides. Such diseases were the plagues of the middle ages, and more recently small-pox, yellow fever and cholera, all diseases against which we have learned to guard ourselves, and which, for this reason, have largely lost for us their terrors. More nearly approaching us, and consequently more dreaded, though not more dangerous, are scarlet fever, diphtheria, measles, typhoid fever, croup, consumption, and a multitude of others, all belonging to the same class of infectious and therefore preventable diseases, escape, from which demands the same price as liberty, viz.: *eternal watchfulness.* The investigations of scientific men have made the causes of these diseases plain. In every instance the person affected was found to be infected with multitudes of exceedingly minute vegetable organisms, whose very number and activity produced the symptoms and affects with which the physician had been familiar for years. These organisms, usually called bacteria or microbes, multiplied at an amazing ratio, and accounted sufficiently for the rapidity with which the disease progressed to a fatal issue. But the most important point was that each disease was connected, as between cause and effect, with a bacterium peculiar to itself, so that an invasion by it of the body of man resulted in the outbreak of this, and of no other disease. Just as the sowing of oats or barley upon fertile ground produced a crop of oats or barley, and not of rye or corn, or anything else, so the introduction into the system of man of the microbe or germ of cholera or typhoid fever produced a crop of these organisms, in such countless numbers, as to disorganize and shake to its very foundation, in a few hours or days, a previously vigorous and perfectly healthy body. The blood, the flesh, the secretions, the excreta, all are filled by them, ready to pass to other yet healthy persons, and to work destruction if not checked by the exercise of intelligent watchfulness.

To keep away from such germs, or keep the germs away from us, is then to escape disease, and where conditions, such as the outbreak of disease in our own household, render this impossible, the destruction of these germs, the killing of their vitality will have the same effect.

I said just now these microbes are vegetable organisms; they are like seeds of plants—like the sperm or dust in a ripe puff-ball—ready to sprout and grow when falling upon suitable ground; but this power to sprout, this vitality, as I called it a minute ago, may be impaired or entirely destroyed by certain agents which are largely used for this purpose and are called disinfectants. The most readily applicable for our purpose—the disinfection of excreta, of the remnants of food, of the vessels in which both are gathered, of the linen and bed clothing of a person suffering from an infectious disease, are carbolic acid, bleaching powder and corrosive sublimate, all three powerful poisons and to be handled with great care and caution.

The bleaching powder, giving off constantly an injurious gas called chlorine, cannot be used for indoor disinfection at all; its employment is limited to throwing it into cesspools, privies, and such places in which the matters previously spoken of as coming from the sick chamber are deposited; these must be gathered with great care and put separately at some distance from the house in a hole dug for that purpose and should receive every day, or as long as the disease lasts, a sprinkling of the bleaching powder. It is neither right nor proper to throw them along with the other refuse from the household upon the ground outside of the house, where rains may wash them upon the premises of the neighbor, or the winds may take them up, when dry, to carry them for miles, a ready source of danger and destruction to other people. Eventually the matter, at the close of the disease by death or recovery, must be liberally covered with bleaching powder and buried under the earth originally removed from the hole.

The corrosive sublimate should be used in solution, one grain of the poison to one ounce of water or any multiple thereof, to put into the vessels used by the patient, a tablespoonful at a time, and to soak in it for at least 24 hours all linen and bed clothes that it is intended to save and use again, before thoroughly washing and rinsing them. All such as are not worth this trouble should be burned in the yard in a fire of brush-wood. These measures should be carried out with conscientious care, as on them depends the prevention of the spread of the disease, and it is plain that if every case of such disease that might arise in a neighborhood, in a country or even in a state were dealt with in the manner described, such disease would be rendered impossible in such district. You see that in matters affecting the health of man

co-operation is as necessary as in measures preventing the outbreak and spread of contagious diseases among animals. And to what use should we put carbolic acid, the third substance mentioned? Recall, if you please, the manner in which I stated these diseases originate; microbes or germs floating as dust in the air find lodgment in a person's organism—it may be the mouth, the throat, the lungs or the stomach and intestinal tract, and, when passing into the circulation, begin their destructive activity. It is true not every germ thus inhaled produces disease. Nature has endowed us in many ways with powers of resistance, by which only a few of the deleterious organisms which we encounter during life escape destruction; but a few do escape, and it is these which the proper use of carbolic acid renders innocuous. This acid, as you are perhaps aware, possesses a powerful though not disagreeable odor; this means, of course, that it is volatile; for no substance not volatile at ordinary temperatures can possess an odor, just as no substance not soluble can possess a taste. A teaspoonful of it put into a little saucer—a butter dish for example—and placed on a shelf or mantel in a room, will have entirely disappeared in a week. It fills the room, seizing upon and destroying every germ and bacterium that may have found entrance into it, and should in the manner indicated be exhibited in every room of the house, especially where children are present, when an outbreak of scarlet fever, of diptheria or of measles is reported in the neighborhood. Such cases are at times found in district school or church before they are completely developed and recognized, and are then the most ready to infect others. I venture to say a timely application of carbolic acid will be an almost certain preventative against the diseases mentioned, and as easily handled. An ounce bought at the druggist will be sufficient for a whole season and for a large house; but it is poisonous, and must be put where children can have no access to it. The little saucers spoken of should be put sufficiently high to be out of reach of the inquisitive hands of the young; for should their little fingers touch it, or should they bring it into their mouths or eyes, the most serious results would happen. This, to be sure, is a risk, but a much less one in its results than the after effects of scarlet fever. Immunity is attainable simply by watchfulness, and the exercise of a certain degree of good sense and judgment. Shall good health and consequent happiness be our part and the part of those that by nature depend upon us? It is in our power to bring this about, and is plainly, therefore, our duty.

In telling you thus of the causes of these dreaded diseases, I have so far spoken only of one way in which spores or microbes may find entry into our bodies, viz.: through the air; but the food we eat and

the water we drink may, as well as the air, be vehicles for the disease. The water especially requires and demands attention. You depend in all probability for your domestic water supply upon cisterns, wells or free flowing springs. The rains, washing the air and freeing it from dust and dirt, perform the same office upon the roof of your houses and fill your cisterns with the debris of leaf and twig, of insect and bird, holding plentifully the germs of bacterial life. Filtering is very well, but practically unsatisfactory. My advice would be not to attempt it, but rather render it unnecessary by a simple device. Have your water pipe over ground, where it can be easily inspected, and arrange at a suitable place a cut-off which, by a turn of a wire handle, turns the water into the cistern, or upon the ground to flow off; then see that the water is turned off, and should a rain occur, wait 10 or 15 minutes until air and roof are clean, then step out and turn the handle; only clean and wholesome water will go into your cistern, and you never need fear on its account. But mind, to turn the water off again as soon as it stops raining, for if you don't, you will forget it and think of it when the next rain has been falling for some time and has washed the dirt from air and roof into the cistern. A simple device, sure to answer, easy of performance. It requires systematic attention, it is true; but what is there worth having that can be gotten without exertion or care? Nothing certainly of any value. Wells and springs, and also, may be, the near creek, demand intelligent supervision if you derive your water supply from them. Surface drainage from farm yard or household may easily pollute their waters. Yet my time is up, and I must give way to Prof. Whitten who will address you on more familiar if less important subjects, and I close with the hope of having made the causes of some diseases, tangible realities to you, against which you may, in an emergency, protect yourself and the members of your household to your great satisfaction and peace of mind.

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

ANNUAL REPORT

OF THE

MISSOURI WEATHER SERVICE.

Co-operating with the State Board of Agriculture.

J. R. RIPPEY, Secretary State Board of Agriculture:

DEAR SIR—The subjoined report of the operations of the Missouri Weather Service for the year ending December 31, 1895, is respectfully submitted:

The work of this Service, especially that in connection with the distribution of weather forecasts and the publication and distribution of the weekly weather-crop bulletin, has been greatly extended during the year, and, although there has been no increase in the force of the central office, nor of the appropriation for the support of the Service, by carefully systematizing the work, and by taking advantage of every opportunity offered for extending and improving the Service through the co-operation of postmasters and others, much more has been accomplished and the Service has been made of much greater value to the agricultural interests of the State than during any previous year since its organization.

STATIONS AND EQUIPMENT.

The number of voluntary meteorological stations remains practically the same as at the close of 1894, nine stations having been established and twelve discontinued during the year, leaving a total of ninety-nine now in operation. Of these stations 49 are equipped with maximum and minimum thermometers and rain gauge, 28 with exposed thermometer and rain gauge, and 22 have rain gauge only. Of the instruments in use, 30 maximum thermometers, 30 minimum thermometers, 4 exposed thermometers and 69 rain gauges are furnished by the State; 12 maximum thermometers, 11 minimum thermometers, 5 exposed thermometers and 16 rain gauges are the property of the U. S. Weather Bureau, and 7 maximum thermometers, 8 minimum thermometers, 19 exposed thermometers and 14 rain gauges are the personal property of the observers.

Applications for the establishment of stations have been received from many points in the State, but owing to lack of funds, it has been impossible to furnish instruments for the establishment of new stations except as old ones were discontinued, all the funds available having been required to repair or replace instruments that were accidentally broken or otherwise rendered unserviceable.

It is to be regretted that more funds were not available for the purchase of instruments, not only that new stations might be established in counties from which no reports are now received, but that those observers who are still, from necessity, using instruments of the cheaper grades might be furnished with maximum and minimum thermometers and rain gauges of standard pattern. The appropriation should also be sufficient to provide each station recording temperature with a standard thermometer shelter. The equipment of a station must be considered incomplete without it.

The following is a list of the voluntary meteorological stations of the Missouri Weather Service, from which reports were received during the year:

Station.	County.	Observer.
Akron	Harrison	L. P. Riley
Appleton City	St. Clair	Prof. Louis Theilman
Arthur	Vernon	J. T. Armstrong
Bethany	Harrison	Newburn & Co.
Big Piney	Pulaski	S. N. Page
Birch Tree	Shannon	D. Meeker
*Bluffton	Montgomery	S. E. Miller
Boonville	Cooper	C. W. Hazell
Brunswick	Chariton	Louis Benecke
Carrollon	Carroll	Pettit & Welch
*Carthage	Jasper	Miss Lenore Sieber
*Centreville	Reynolds	Dr. M. McKenzie
Conception	Nodaway	Fr. Adelhelm Hess
Cowgill	Caldwell	William McCray
Darksville	Randolph	W. H. Broaddus
*Dixon	Pulaski	J. F. Rhea
Downing	Schuyler	Mat. Coffey
East Lynne	Cass	David Sharp
Edgehill	Reynolds	John S. Luthy
Eight Mile	Cass	J. H. Sharp
Eldon	Miller	S. Newton
Elmira	Ray	S. H. VanTrump
Emma	Lafayette	Henry Miller
Fairport	DeKalb	H. C. Burnham
Farmersville	Livingston	W. H. Baker
Fayette	Howard	Prof. T. Berry Smith
Fox Creek	St. Louis	William Muir
Fulton	Callaway	C. H. Richmond
Gallatin	Daviess	W. P. Young
Gayoso	Pemiscot	J. W. Collet
Glasgow	Howard	Prof. C. W. Pritchett
*Glensted	Morgan	C. L. Burney
Gordonville	Cape Girardeau	L. M. Bean
Gorin	Scotland	J. W. Pulliam
Grovedale	Maries	Lindon Marts

Station.	County.	Observer.
Half Way	Polk	I. C. Summers
Harrisonville	Cass	A. J. Sharp
Hastain	Benton	Dr. J. I. Brady
Houston	Texas	E. J. Tweed
Houstonia	Pettis	S. J. Spurgeon
Humansville	Polk	W. E. McElree
Ironton	Iron	W. H. Delano
Jefferson City	Cole	J. J. Henderson
Kidder	Caldwell	M. G. Allen
Lamar	Barton	E. H. Adams
Lamonte	Pettis	W. D. Wade
Langdon	Atchison	F. M. Joslyn
Lebanon	Laclede	M. W. Serl
Lexington	Lafayette	Chas. Teubner
Liberty	Clay	Prof. J. R. Eaton
Linn Creek	Camden	F. F. Henderson
McCune Station	Pike	Marcus W. Wood
Marble Hill	Bollinger	Jacob J. Conrad
Marceline	Linn	E. D. Hicks
Marshall	Saline	Prof. W. H. Black
Maryville	Nodaway	J. R. Brink
Mexico	Audrain	J. F. Llewellyn
Miami	Saline	Dr A. H. W. Sullivan
Mine LaMotte	Madison	J. D. Sanders
†Mineral Springs	Barry	Mrs. Carrie M. Smith
Mount Vernon	Lawrence	E. S. Allen
Neosho	Newton	(a) Wm. F. Page
Nevada	Vernon	C. Jewell
*New Hartford	Pike	J. A. B. Keith
New Haven	Franklin	Max Eimbeck
New Madrid	New Madrid	Powell & Hummel
New Palestine	Cooper	A. J. Zeigle
Oakfield	Franklin	E. E. Steines
Oak Ridge	Cape Girardeau	Henry Bruihl
Olden	Howell	H. Montgomery
Oregon (a)	Holt	William Kaucher
Oregon (b)	"	Sam M. Ruley
Osceola	St. Clair	Sewart Love
Oto	Stone	Ettie W. Cox
Palmyra	Marion	(b) H. C. Scheetz
Phillipsburg	Laclede	(c) G. W. Huppert
Pickering	Nodaway	M. B. W. Harman
Peirce City	Lawrence	(d) J. J Spillman
Platte River	Buchanan	W. A. McDowell
Poplar Bluff	Butler	Dr. M. E. Shelton
Potosi	Washington	C. V. F. Hochstatter
Princeton	Mercer	Dr. Wm. Hirons
Rhineland	Montgomery	S. E. Miller
Rolla	Phelps	Prof. A. H. Timmerman
St. Charles	St. Charles	Louis C. Saeger
St. Joseph	Buchanan	W. R. Burnham
St. Louis (Forest Park)	City of St. Louis	F. W. Duenckel
Sarcoxie	Jasper	Thos. McNallie
Shelbina	Shelby	Jno. S Chandler
Sikeston	Scott	Prof. D. W. Lutes
Steffenville	Lewis	E. L. Hall
Sublett	Adair	Lewis Spriggs
Tindall	Grundy	James H. Brokaw
Trenton	"	(e) Mrs. C. I. Roberts
Unionville	Putnam	J. Arthur Townsend
*Vera Cruz	Douglas	L. E. Riley
Vermont	Cooper	J. R. Marye
Versailles	Morgan	C. L. Burney
Vilas	Worth	C. M. Hunt
Virgil City	Cedar	(f) Geo. H. Huff
Warrensburg	Johnson	Prof. Geo. L. Osborne

Station.	County.	Observer.
Warrenton	Warren	Prof Jno. H. Frick
Wheatland	Hickory	W. H. Liggett
Willow Springs	Howell	(g) Geo. Comley
Windsor	Henry	G. W. Goodlett
Zeitonia	Wayne	O. C. Lucy

* Discontinued during the year.

† Formerly Panacea.

(a) Observations from January to July by G. E. Nichols.

(b) Observations during January and February by J. R. Dudley.

(c) Observations during March by J. T. Mansfield.

(d) Observations from March to July by A. W Spillman.

(e) Observations from May to September by Alfred Chapman.

(f) Observations during January and February by J. W. May.

(g) Observations from January to July by Rev. John Brereton.

In addition to the above, monthly reports are also received from five regular and four special stations of the National Weather Bureau in the State, and two regular and one special station of the National Service, and seven voluntary stations on the borders of adjacent states.

Voluntary observers take daily observations of temperature, precipitation, wind direction and cloudiness, record the dates of thunder storms, hail storms, high winds, floods, frosts and other miscellaneous phenomena, and forward complete reports to the central office at the close of each month. They also furnish during the crop-growing season, weekly reports of temperature and precipitation for use in compiling the weekly weather crop bulletin.

The reports received from voluntary observers during the past year have, as a rule, been promptly rendered and very satisfactory.

None of the voluntary stations have been inspected during year, there being no funds available for that purpose.

THE MONTHLY BULLETIN.

The reports received from voluntary observers each month have been carefully examined, the data for the monthly bulletin compiled, and the bulletin issued by about the 15th of the month succeeding that for which it is the record.

Beginning with the December number the publication of precipitation charts was commenced and will be continued during 1896. These charts show in a graphic manner the total precipitation for the month and its distribution over the State, and it is believed will prove a valuable and interesting feature of the bulletin. No other change of importance has been made in the bulletin during the year, and no material increase in the circulation is possible with the present appropriation.

THE WEEKLY WEATHER CROP BULLETIN.

The publication of the weekly weather crop bulletin was begun April 9, and the bulletin was issued regularly on Tuesday of each week until October 1, when, all crops being practically matured, it was discontinued for the season.

The bulletin was printed at this office, as heretofore, and as it was impracticable to increase the size a font of minion type was purchased expressly for this work in order that more information might be given in the same space. Reports were received each Monday from nearly 300 farmers, representing all counties of the State, and on Monday afternoon a brief summary of the weather and crop conditions throughout the State was prepared and printed on postal cards for distribution to the press. In the regular issue of the bulletin this summary was followed by extracts from the reports of correspondents, arranged by counties. Three hundred and fifty copies of the advance summary for the press were sent out each Monday, and 2300 copies of the complete bulletin were printed and mailed each Tuesday during the season. Through the co-operation of postmasters copies of the bulletin were posted each week in over 1400 postoffices, or about half the postoffices in the State.

During October a special bulletin, reviewing the weather conditions of the crop season, was prepared and 1200 copies printed and distributed to voluntary observers, crop correspondents and the press.

The value of the crop bulletins can be more fully appreciated when we realize that it is the only means by which the producers, consumers and local dealers gain reliable information in regard to prevailing crop conditions.

It is true that large option dealers have a crop-reporting system of their own, maintained at their expense, and will, no doubt, like all other business men, use it to their advantage.

It is not so with the producer. He has no organization for this purpose and no means for its sustenance.

Unless the United States Department of Agriculture and the State comes to the relief of the public with an impartial review of crop conditions, the producer in many instances may be induced to sell for less than the conditions would warrant, and after the crop has passed into the hands of the speculator the consumer is forced to pay an exhorbitant price.

But with this weekly crop bulletin, compiled from reports of 300 intelligent farmers, printed in the metropolitan and county press, with

copies posted in every postoffice in the State, there is no reason why all may not be equally well informed and crops be placed on the market at such time and under such condition as promise the best returns.

WEATHER FORECASTS.

The following is a list of the forecast display stations in the State on December 31, 1895. All stations receive forecasts by telegraph or telephone, except where otherwise noted :

Station.	County.	Displayman.
Appleton City	St. Clair	W. B. Leslie
Bolivar	Polk	Dan C. Farrar
Boonville	Cooper	W. S. Stephens
Brunswick	Chariton	Louis Benecke
Carrollton	Carroll	Petit & Welch
Charleston	Mississippi	M. V. Golder
Chillicothe	Livingston	P. Randolph
*Clarence	Shelby	George A. Stone
Clinton	Henry	Jas. Hurley
Columbia	Boone	E. W. Stephens
Concordia	Lafayette	Prof. J. H. C. Kaeppel
Deepwater	Henry	C. M. Beem
DeSoto	Jefferson	Chas. M. Gill
Dunnegan	Polk	Rev. J. M. Clark
Gallatin	Daviess	Gallatin Dry Goods & Grocery Co.
Holden	Johnson	H. C. Conner
Independence	Jackson	E. Peterson
Jackson	Cape Girardeau	Wm. Paar
Jefferson City	Cole	J. J. Henderson
Joplin	Jasper	Herald Printing Co.
Kirksville	Adair	Wm. D. Sigler, Jr
Lamar	Barton	E. H. Adams
Lathrop	Clinton	N. E. Owen
Lebanon	Laclede	M. T. Blickensderfer
Lewiston	Lewis	Everett Porter
*Linneus	Linn	L. C. Phillips
Macon	Macon	Lou S. Deal
Manchester	St. Louis	Schreiner, Flack & Co
Maryville	Nodaway	J. R. Brink
*Merwin	Bates	A. J. Oakes
Mexico	Audrain	R. M. White
Mound City	Holt	J. B. Denny
Neosho	Newton	Wm. F. Page
New Cambria	Macon	A. J. Barton
New Florence	Montgomery	C. E. Stewart
New Haven	Franklin	Max Eimbeck
*Parkville	Platte	Prof. S. L. McAfee
Plattsburg	Clinton	F. M. Riley
Princeton	Mercer	Wm. Hirons, M. D
Richmond	Ray	B. G. Shackelford
Ridgeway	Harrison	H. N. Burgin
St. Charles	St. Charles	Vinke Bros
Unionville	Putnam	J. A. Townsend
Warrensburg	Johnson	Prof. G. L. Osborne
West Plains	Howell	George Turner

*Receive forecasts by mail.

In addition to the above emergency warnings, i. e., warnings of the approach of severe storms, severe cold waves, etc., are telegraphed to a total of 193 places in the State.

The conditions under which the forecasts are furnished by telegraph at Government expense for the display of signals are, that the person receiving them, or those interested in the displays, provide a set of flags and pole and halyards for displaying them, or arrange for the sounding of whistle signals, attend to displaying the flags or sounding the signals, each day, promptly upon receipt of the forecast telegram, and render a monthly report to the central office showing time of receipt of messages and time signals were hoisted or blown.

During the past year especial attention has been given to the distribution of forecasts by mail by what is known as the logotype system. Through the co-operation of postmasters and forecast displaymen, a large number of centres have been established for the distribution of forecasts by this plan, and the total number of postoffices in the State furnished the forecast bulletins daily has been increased from about 300 at the close of 1894 to over 1000 at the close of 1895. The National Weather Bureau telegraphs the forecasts daily, at Government expense, to the postmaster or displayman at each distributing centre, and furnishes him with franked postal cards for use in mailing copies of the messages to such towns as can be reached in time to make the forecasts of value. All postmasters and displaymen who distribute forecasts to more than four sub-offices are also furnished a rubber logotype outfit for use in duplicating the messages on the cards. The postmasters who receive the cards are furnished with a neat bulletin board on which to display them for the benefit of the public. The postal cards used in this connection are furnished ready addressed and the work of addressing them now forms a considerable part of the work of the central office.

The following is a list of the distributing centres, with the names of the distributing displaymen, or postmasters, and the postoffices furnished the forecasts from each :

APPLETON CITY—W. B. LESLIE, DISPLAYMAN.

Appleton City,	LaDue,	Schell City,
Eldorado Springs,	Montrose,	Walker
Harwood,	Rockville,	

BAGNELL—W. S. BROCKMAN, POSTMASTER.

Blackmar,	Damsel,	Ulman,
Brumley,	Linn Creek,	Zebra.

BOLIVAR—DAN C. FARRAR, DISPLAYMAN.

Buckley,	Harold,	Sentinel Prairie,
Buffalo,	Morrisville,	Slagle,
Burns,	Pearl,	Sunset,
Cave Spring,	Pittsburg,	Tremont,
Graydon Springs,	Polk,	Willard,
Half Way,	Reynolds,	Wishart.

BONNOT'S MILL—H. U. CARTIER, POSTMASTER.

Allenton,	Etlah,	Osage City,
Berger,	Gasconade,	Otterville,
Boles,	Glencoe,	Rich Fountain,
Byberry,	Gray's Summit,	Sherman,
California,	Hermann,	Smithton,
Centretown,	Isbell Station,	St. Aubert,
Chamois,	Linn,	Syracuse,
Clarksburg,	Loose Creek,	Taos,
Dicks,	Marion,	Tipton,
Dundee,	McGirk,	Washington,
Elston,	Morrison,	Westphalia.

Forecasts are also mailed to J. J. Henderson, displayman, Jefferson City, Mo.

BOONVILLE—W. S. STEPHENS, DISPLAYMAN.

Boonville,	Gooch Mill,	Prairie Home,
Bunceton,	New Palestine,	Vermont.
Clark's Fork,		

BRUNSWICK—LOUIS BENECKE, DISPLAYMAN.

Dalton,	Keytesville,	Padgett.
Indian Grove,	Newcomer,	

CARTHAGE—B. F. THOMAS, POSTMASTER.

Alba,	Brest,	Fidelity,
Avilla,	Dimple,	Parshley.

CAWOOD—ANNA F. POTTS, POSTMASTER.

Clyde,	Oxford,	Rush,
Conception,	Parnell,	Savannah,
Guilford,	Ravenwood,	Sheridan,
Isadora,	Rea,	Whitesville.

CHADWICK—CLAYTON McCORD, POSTMASTER.

Bradleyville,	Garrison,	Sparta,
Cassidy,	Gates,	Swan,
Forsyth,	Greenleaf,	Taneyville.
Galloway,	Ozark,	

CHARLESTON—M. V. GOLDER, DISPLAYMAN.

Belmont,	Charleston,	Dudley,
Bertrand,	Crosno,	Fisk,
Buckeye,	Diehlstadt,	Morehouse.
Buffington,		

CLINTON—JAS. F. HURLEY, DISPLAYMAN.

Alberta,	Gaines,	Norris.
Aldrich,	Gulf,	Osceola.
Ash Grove,	Hartwell,	Peculiar.
Belton,	Huntingdale,	Petersburgh.
Coal,	Leesville,	Phenix.
Collins,	Lowery City,	Urich.
Creighton,	Lucas,	Vista.
Eight Mile,	Mayesburgh.	Walnut Grove.

DEEPWATER—C. M. BEEM, POSTMASTER.

Brownington,	Johnson City,	Ohio.
Finney,	Mount Zion,	

DOE RUN—THOS. M. MASTERSON, POSTMASTER.

Bonne Terre,	Festus,	Knorpp.
Crystal City,	Flat River,	McCormic.
Desloge,	Flucom,	Plattin.
Elvins,	Herculaneum,	Valles Mines.

DONIPHAN—EDWIN FERGUSON, POSTMASTER.

Fair Dealing,	Naylor,	Varner.
Gamburg,	Neeleysville,	

ETHEL—G. W. MILLER, POSTMASTER.

Baring,	Gorin,	Millport,
Dumas,	Hurdland,	Revere,
Edina,	Kenwood,	Rutledge,
Elmer,	LaCrosse,	Sand Hill,
Gibbs,	LaPlata,	Wyaconda.
Goldsberry,	Medill,	

FOREST CITY—JOHN FRANCE, JR., POSTMASTER.

Elm Grove,	New Point,	White Cloud, Kan.
Napier,	Oregon,	

FULTON—W. V. BERRY, POSTMASTER.

Calwood,	Ham's Prairie,	Reform,
Earl,	Millersburg,	Toledo.

GLEN ALLEN—E. S. LETT, POSTMASTER.

Ardeola,
Avert,
Barroll,
Bell City,
Benton,
Bessville,
Bleda,
Blodgett,
Bloomfield,
Commerce,
Cornwall,
DeLassus,
Dexter,
Farmington,
Fredericktown,
Henson,
Houck,
Idalia,
Knob Lick,
Laflin,
Leopold,
Loughboro,
Lutesville,
Marble Hill,
Marquand,
Mine LaMotte,
Morley,
New Hamburg,
Oran,
Patton,
Randles,
Sedgwickville,
Syenite,
Tilsit,
Whitewater.

HARTSBURG—A. C. BLEDSOE, POSTMASTER.

Burlington,
Cedar City,
Claysville,
Cote Sans Dessein,
Easley,
Effie,
Huntsdale,
McBaine,
Mokane,
Musick,
Providence,
Rosalee,
Steedman,
Tebbitts,
Wainwright,
Wilton.

HOLDEN—H. C. CONNER, DISPLAYMAN.

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East Lynne,
Elm,
Fulkerson,
Gunn City,
Kingsville,
Pittsville.

JACKSON—WM. PAAR, DISPLAYMAN.

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Bee,
Burfordville,
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Gravel Hill,
Gordonville,
Leemon,
Millersville,
Neely's Landing,
New Wells,
Oak Ridge,
Pocahontas,
Shawneetown.

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Island City,
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LAMAR—E. H. ADAMS, DISPLAYMAN.

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Bushnell,
Duval,
Esrom,
Golden City,
Iantha,
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Liberal,
Lockwood,
Milford,
Nashville,
Newport,
Sheldon.

LATHROP—N. E. OWEN, DISPLAYMAN.

Converse,
Holt.

LEASBURG—JOHN R. KING, POSTMASTER.

Argo,	Jake Prairie,	Robertsville,
Bourbon,	Japan,	Saint Clair,
Catawissa,	Keysville,	Salem,
Cook Station,	Meramac Highlands,	Sligo,
Condray,	Midland,	Stanton,
Crescent,	Morrellton,	Steelville,
Cuba,	Moselle,	Sullivan,
Delhi,	Oak Hill,	Valley Park,
Eureka,	Pacific,	Whitsett,
Jacobston,	Red Bird,	Wilson Mills.

LEBANON—M. T. BLICKENSDERFER, DISPLAYMAN.

Arlington,	Marshfield,	Richland,
Conway,	Newburgh,	Sleeper,
Crocker,	Niangua,	Stoutland,
Dixon,	Northview,	Strafford,
Hancock,	Phillipsburg,	Swedeborg.

LEWISTON—EVERETT PORTER, DISPLAYMAN.

Monticello.

LUCERNE—E. M. GREGORY, POSTMASTER.

Alpha,	Galt,	Ludlow,
Braymer,	Half Rock,	Newton,
Chula,	Harris,	Osgood,
Cowgill,	Judson,	Plymouth,
Dawn,	Laredo,	Polo,
Elmira,	Lawson,	Sturges,
Farmersville,	Lindley,	Wintersville.

MACON—LOU S. DEAL, DISPLAYMAN.

Anabel,	Lingo,	Redman,
Hinkle,	Nickelton,	Ten Mile.
Lentner,		

MANCHESTER—SCHREINER, FLACK & CO., DISPLAYMEN.

Ballwin,	Grover,	Manchester,
Ellisville,	Hollow,	Melrose,
Fox Creek,	Kelpe,	Pond.

MARYVILLE—J. R. BRINK, DISPLAYMAN.

Allison,	Bolckow,	Orrsburg,
Arkoe,	Gaynor,	Pickering,
Barnard,	Hopkins,	Rosendale.

MINERAL POINT—C. L. DANIELS, POSTMASTER.

Annapolis,
Arcadia,
Belleview,
Bismarck,
Blackwell,
Brunot,
Cadet,
Caledonia,
Clearwater,
Des Arc,
Glover,
Harviell,
Hematite,
Hendrickson,
Hillard,
Hillsboro,
Hopewell,
Horine Station,
Irondale,
Ironton,
Keener,
Kerrigan,
Leeper,
Middlebrook,
Mill Spring,
Mineral Point,
Pevely,
Piedmont,
Pilot Knob,
Potosi,
Poplar Bluff,
Sabula,
Silica,
Summit,
Victoria,
Vineland,
Williamsville,
Zeitonia.

NAPTON—T. E. CRUTCHER, POSTMASTER.

Arrow Rock,
Blackwater,
Blosser,
Dover,
Grand Pass,
Hardeman,
Hodge,
Koping,
Lamine,
Lexington,
Malta Bend,
Nelson,
Ridge Prairie,
Waverly.

NEOSHO—J. F. SHANNON, POSTMASTER.

Art,
Belfast,
Christopher,
Diamond,
Donohue,
Indian Springs,
Sweetwater,
Wall.

NEW FLORENCE—C. E. STEWART, DISPLAYMAN.

Bellflower,
Big Springs,
Gamma,
Hugo,
Shamrock,
Williamsburg.

NORBORNE—GEO. F. CRUTCHLEY, POSTMASTER.

Atherton,
Courtney,
Miles Point,
Roads,
Rockingham,
Sibley,
Stet,
Sugartree.

PLATTSBURG—F. M. RILEY, DISPLAYMAN.

Perrin.

PORTLAND—M. KLEIN, POSTMASTER.

Augusta,
Bluffton,
Case,
Defiance,
Dutzow,
Gore,
Hamburg,
Holstein,
Marthasville,
Matson,
McKittrick,
Peers,
Pickney,
Readsville,
Rhineland,
Weldon Spring.

PRINCETON—DR. WM. HIRONS, DISPLAYMAN.

Alvord,	Ilia,	Ravanna,
Cleopatra,	Jamesport,	Spickard,
Goshen,	Mercer,	Tindall,
Haw,	Mill Grove,	Topsy,
Hickory,	Modena,	Trenton.

RIDGEWAY—H. N. BURGIN, DISPLAYMAN.

Akron,	Darlington,	Martinsville,
Albany,	Dinsmore,	Mount Moriah,
Andover,	Eagleville,	New Hampton,
Bethany,	Evona,	Rochester,
Blue Ridge,	Ford City,	Thomas,
Blythedale,	Hatfield,	Union Star,
Brooklyn,	Helena,	Washington Center.
Cosby,		

ROLLA—E. Y. MITCHELL, POSTMASTER.

Fanning,	Macedona,	Vichey.
Knobview,	St. James,	

SEDALIA—V. P. HART, POSTMASTER.

Aullville,	Hughesville,	Page City,
Emma,	Kemp,	Sweet Springs,
Georgetown,	Longwood,	Thornleigh.
Houstonia,		

SMITHVILLE—ADAMS & LA FORCE, DISPLAYMEN.

Barry,	Linden,	Paradise,
Edgerton,	Moscow,	Ridgeley,
Hoover,	Nashua,	Smithville.

THAYER—H. N. POWELL, POSTMASTER.

Alton,	Garfield,	Myrtle.
Couch,	Jeff,	

UNIONVILLE—J. A. TOWNSEND, DISPLAYMAN.

Arbela,	Chariton,	Granger,
Bairdstown,	Cora,	Graysville,
Blackbird,	Crawford Station,	Green Castle,
Bogard,	Danforth,	Green City,
Boomer.	Delpha,	Hale,
Boynton,	Downing,	Hamilton,
Breckenridge,	Easton,	Hartford,
Browning,	Elko,	Hemple,
Bullion,	Esper,	Howland,
Cameron,	Gehm,	Kearney,

Keystone,	Novinger,	Sorrell,
Kidder,	Omaha,	Stewartsville,
Laclede,	Osborn,	Tina,
Lancaster,	Pollock,	Turney,
Martinstown,	Powersville,	Utica,
Meadville,	Purdin,	West Liberty,
Medicine,	Quinn,	Wheeling,
Mendota,	Saxton,	Xenia,
Milan,	Sidney,	Yuma,
Mooresville,	Stahl,	Zola.
Nettleton,		

Forecasts are also mailed to L. C. Phillips, Displayman, Linneus, and D. W. Pollock, Displayman, St. John.

VERSAILLES—JOHN D. BOHLING, POSTMASTER.

Akinsville,	Excelsior,	Gravois Mills,
Barnett,	Fortuna,	Rico,
Billingsville,	Glensted,	Stover.
Boyler's Mills,		

WARRENSBURG—PROF. G. L. OSBORNE, DISPLAYMAN.

Aubrey,	Fayetteville,	Lamonte,
Burtville,	Greendoor,	Leeton,
Chilhowee,	Henrietta,	Montserrat,
Columbus,	Hoffman,	Robins,
Dresden,	Knob Noster,	Strasburg.

In addition to the above the following postoffices in the State are furnished forecasts by mail from the regular stations of the National Weather Bureau:

FROM COLUMBIA.

Alma,	Cairo,	Dripping Spring,
Anglum,	Calhoun,	Elliott,
Ardmore,	Cambridge,	Englewood,
Armstrong,	Camden,	Estill,
Ashland,	Camp Branch,	Excello,
Atlanta,	Carlow,	Fairville,
Auxvasse,	Carrington,	Farber,
Bates City,	Centralia,	Fayette,
Beaman,	Clark,	Ferguson,
Bedford,	Clifton City,	Fleming,
Bellville,	Clifton Hill,	Forest Green,
Benton City,	College Mound,	Forestell,
Birmingham,	Corder,	Fountain Grove,
Blackburn,	Cuivre.	Gallatin,
Blue Springs,	Cunningham,	Gilliam,
Bonfils,	Curryville,	Gilmore,
Bowling Green,	Danville,	Glasgow,
Bridgton,	Deer Park,	Glenwood,
Burton,	DeWitt,	Grain Valley,

Green Ridge,
Greentop,
Guthrie,
Hallsville,
Hardin,
Harrisburg,
Harriston,
Henry,
Higbee,
Higginsville,
High Hill,
Hinton,
Holt's Summit,
Huntsville,
Jacksonville,
Jameson,
Jonesburg,
Julesburg,
Kinlock,
Kirksville,
Laddonia,
Lewis Station,
Lock Spring,
Louisiana,
Love Lake,
Madisonville,
Marshall,
Martinsburg,
Mayview,
McCredie,
Mexico,
Meyers,
Miami,
Miami Station,
Middletown,
Midway,
Millard,
Minaville,
Mineola,
Missouri City,
Moberly,
Montgomery City,
Mt. Airy,
Mt. Carmel,
Mt. Leonard,
Myers,
New Bloomfield,
New Franklin,
Norton,
Norville,
Oak Grove,
Odessa,
O'Fallon,
Old Franklin,
Orrick,
Overton,
Pattonsburg,
Pendleton,
Perche,
Pleasant Green,
Pilot Grove,
Queen City,
Randolph,
Randolph Springs,
Renick,
Rileysburg,
Roanoke,
Rocheport,
Rowena,
Rucker,
Rush Hill,
Saling,
Salisbury,
Salt Springs,
Sampsell Station,
Shackleford,
Shannondale,
Skinner,
Slater,
Steinmetz,
St. Peters,
Sturgeon,
Sublett,
Sumner,
Switzler,
Thompson,
Trinity,
Triplett,
Truesdale,
Tulip,
Vandalia,
Venice,
Wakenda,
Warrenton,
Wellsville,
Wentzville,
Worcester,
Wright City,
Yates.

FROM KANSAS CITY.

Adrian,
Agency,
Amazonia,
Amoret,
Amos,
Amsterdam,
Annie,
Archie,
Artesian Springs,
Arthur,
Asbury,
Atchison Junction,
Austin,
Belton,
Beverly Station,
Bigelow,
Blairstown,
Bois de Arc,
Butler,
Carbon Centre,
Carl Junction,
Carterville,
Carytown,
Cleveland,
Cornland,
Corning,
Craig,
Curzon,
Dayton,
DeKalb,
Drexel,
Everette,
Everton,
Farley,
Fortescue,
Frazer,
Gower,
Grand View,
Greenfield,
Greenwood,
Halleck,
Halls,
Hampton,
Harrisonville,
Hickman Mills,

Holmes Park,
Horton,
Hume,
Iatan,
Independence,
Irwin,
Jandon,
Jasper,
Katy,
Kenmoor,
Kenoma,
Langdon,
Lee's Summit,
Liberty,
Lisle,
Little Osage,
Lone Tree,
Main City,
Maurine,
Merwin,
Milo,
Mulberry,
Nelson,
New Home,
Nichols,
Nishnabotna,
Nodaway,
Ore,
Panama,
Parkville,
Pedro,
Phelps City,
Pilgrim,
Plainfield,
Platte City,
Pleasant Hill,
Powell Siding,
Richards,
Rich Hill,
Richmond,
Rockport,
Rushville,
Saginaw,
Shobe,
South Greenfield,
Sprague,
Spruce,
Stanberry,
St. Joseph,
Stotesbury,
Sugar Lake,
Swart,
Tarnsey,
Tipton Ford,
Tracy,
Verdello,
Virginia,
Waco,
Waldron,
Wallace,
Watson,
Webb City,
West Line,
Weston,
Westport,
Wolfe,
Worland,

FROM HANNIBAL.

Amanda,
Ashburn,
Ashley,
Ashton,
Bethel,
Brevier,
Bucklin,
Bullion,
Callao,
Canton,
Centre,
Clapper,
Clarence,
Clarksville,
Cyrene,
Dameron,
Davis,
Downing,
Duncan's Bridge,
Durham,
Edgewood,
Edina,
Elsberry,
Ely,
Eolia,
Evansville,
Famous,
Florida,
Foley,
Frankford,
Gilead,
Granger,
Granville,
Hassard,
Hoeberville,
Hunnewell,
Huntington,
Indian Creek,
Kahoka,
Kissenger,
Knox City,
LaBelle,
LaGrange,
Lakenan,
Lancaster,
Louisiana,
Louisville,
Luray,
Madison,
McCune Station,
Memphis,
Monroe City,
Moscow Mills,
New Hartford,
New London,
Noonan,
Oakwood,
Owen,
Palmyra,
Paris,
Peaksville,
Philadelphia,
Rennsellier,
Saverton,
Shelbina,
Shelbyville,
Silex,
Smileyville,
St. Catharine,
St. Clement,
Troy,
Warren,
West Ely,
White Ledge,
Whiteside,
Williamstown,
Winfield,
Woodland,
Woodlawn.

FROM ST. LOUIS.

Alexandria,	Gregory,	Pattonville,
Bellefontaine,	Gumbo,	Port Royal,
Busche,	Jefferson Barracks,	Quarantine,
Bushberg,	Kirkwood,	St. Charles,
Castello,	Knorpp,	Shrewsbury,
Centaur Station,	Monarch,	Tuxedo,
Clayton,	Normandy,	Webster Groves,
Dardenne,	Oakville,	Wellston.
Flucom,	Old Orchard,	

FROM SPRINGFIELD.

Abbott,	Fair Grove,	Nichols,
Billings,	Griffin,	Republic,
Brookline,	Hickory Barren,	Roseville.
Dorchester,	Needmore,	

FROM CAIRO, ILL.

Appleton,	Essex,	Poplar Bluff,
Bertrand,	Egypt Mills,	Point Pleasant,
Bird's Point,	Gayoso,	Sikeston,
Caruthersville,	Harviell,	Wappapello.
Charleston,	Neelysville,	

Forecast bulletins are also sent from Columbia daily to agents of the Wabash railroad between Columbia and Centralia; St. Louis and Kansas City, and Moberly and Coatsville to be posted in the depot waiting rooms.

In addition to the distribution of forecasts to postmasters, daily weather maps and forecast cards are distributed from the regular Weather Bureau stations to shippers, produce merchants and others whose interests may be affected to a considerable extent by weather conditions, and also to schools, colleges, libraries and other public institutions. The total number of weather maps and cards distributed to points in Missouri from each station December 31, 1895, was as follows: From St. Louis, 507 weather maps and 458 forecast cards; from Hannibal, 154 weather maps and 54 forecast cards; from Kansas City, 193 weather maps and 160 forecast cards; from Cairo, Ill., 23 weather maps, and from Keokuk, Ia., 3 weather maps.

In December, 1895, an entirely new plan for the local distribution of forecasts was put in operation at Columbia. The postmaster was furnished a suitable rubber stamp, with the necessary logotypes, and through his co-operation the forecast for the following day is stamped upon all letters received at the office after 10 a. m., this stamp taking the place of the regular receipt stamp. By this plan all persons in the

city who receive letters by the afternoon mails also receive the weather forecast for the following day. The plan has worked well and has given excellent satisfaction and it is hoped arrangements can be made whereby it can be put in use at other offices in the State during the coming year.

GENERAL REMARKS.

The value of the climate and crop service depends in a great measure upon the efficiency of voluntary observers and of its corps of crop reporters. The best efforts of the Service have been used to get only men of a high order of intelligence and matured judgment for this purpose. While no personal inspection of the meteorological stations can be made for want of means, the promptness with which reports are made, the character of the reports and the earnestness of this corps of workers indicates that the crop reports are made with much care and closely approximate existing conditions, and that the meteorological observations are made with accuracy and by those feeling a deep interest in the work.

For this work so efficiently and intelligently rendered, to these men who in the interest of the services and without remuneration have done this work and given it their attention, we wish to acknowledge our obligations and express our high appreciation of their services.

The work of this Service and the data compiled can be beneficial only when it is given to the public. Our greatest means of dissemination is through the press. A majority of newspapers in the State publish the crop bulletins and such other information as may be given out to them. In this way this data may be given to every family in the State, and this act of the press is appreciated by the public, and is recognized as almost a necessity in the successful operation of this Service.

This Service is conducted by the United States Weather Bureau co-operating with the State Board of Agriculture. Its object is the study of local climatic conditions and their effects upon the crops, and is expected to prove of special benefit to farmers and others interested in the production of staple agricultural products.

The great burden of expense falls on the General Government. The salary of the observer and messenger, at the central office, the cost of wiring forecasts to distributing centers, frost, cold wave and emergency warnings to points where they may be of value; supplies for distributing forecasts, stationery and the use of the franking privilege, all being borne by the United States Weather Bureau. The State ap-

propriates $500 per annum for this Service, out of which is furnished offices, fuel, lights, printing and the supply of instruments.

The work of the Service may be extended with profit in many directions and no doubt will be at an early date. Its value is appreciated by the masses, and the information given out is eagerly sought from every quarter of the State.

But no material increase or extension of the work can be made without additional means. Every dollar at the command of the Service is used in the most economical manner.

The National Weather Bureau has contributed most liberally to the support of the Service. The Service was organized at its suggestion and could not have been sustained without its assistance, and to that Bureau, in a large measure, should be credited what is of value in this work.

Very respectfully,

A. E. HACKETT,

Observer Weather Bureau, Assistant Director.

MONTHLY AND ANNUAL MEAN TEMPERATURE—1895.

Missouri Weather Service.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual.
Northwest section.													
Atchison, Kan.	22.6	23 8	40.8	58.2	65.0	72.1	73.6	74.4	71.7	52.3	39.8	30.6	52.1
Bethany	19.4	21.0	38.8	57.0	64.4	72.2	74.1	74.9	72.0	49.8	38.1	.....	.....
Carrollton	24.8	24 4	42.4	58.6	65.0	73.0	78.8	75.6	72.4	52.6	41.6	33.6	53.1
College Springs, Ia.	.....	20.6	38.4	55.4	63.8	68.8	71.4	.....	.....	.....	37.8	28.6	.....
Conception	21.2	23.3	40.1	57.8	64.6	70.8	72.7	73.4	70.7	51.8	40.5	32.8	51.6
Cowgill (4)	23.1	24 8	42.9	60 4	66.4	73.9	75.5	76.6	74.9	54.0	42.7	33.5	54.1
Elmira	21.4	21.8	40.9	58.2	65.0	72.0	73.2	74.2	71.8	50.1	40.2	30.6	51.6
Gallatin (1)	21.2	21.8	39.8	57.6	64.3	71.6	73.8	74.7	71.8	51.2	39.0	30.4	51.4
Kansas City	24.0	24.9	42.2	59.6	65.4	73.0	74.2	75.3	73.2	53.2	41.1	32.6	53.2
Kidder	21.4	21.4	39.8	57.5	64.6	72.2	73.6	74.3	72.0	50.2	38.8	29.2	51.2
Langdon	20.0	21.3	38.6	56.4	63.6	69.9	73.4	.....	.....	.....	.....	.....	.....
Lexington	24.4	24.0	42.8	59.4	64.8	71.5	73.2	74.6	72.2	53.1	42.1	33.5	53.0
Liberty	23 6	24.9	43.4	61.3	67.8	74.9	76.0	78.7	74.8	52.8	40.7	32 2	54.3
Maryville (3)	16.6	18.2	34.6	52.8	60.2	69 6	70.2	69.6	65.8	44.3	34.3	26.5	46.7
Neb. City, Neb. (1)	15.8	19.2	34.8	54.6	61.1	68.1	71.0	71.2	67.6	.....	39.3	31.7	.....
Nemaha, Neb (1)	19.9	23.2	40.3	57.0	64 0	72.0	75.8	72.8	72.7	47.8	36.4	29.2	50.9
Oregon *a*	22.3	23.8	41.6	59.8	65.9	72 2	75.1	75.4	73.2	53.0	40.7	30.6	52.8
Oregon *b* (1)	21.0	22 2	40.5	58.5	65.1	70.5	73.4	74.0	71.8	50.5	38.8	29.2	51.3
Pickering (2)	17.7	17.8	35.8	51.4	59.8	67.7	70.3	71.3	70.2	48.0	38.7	29.8	48.2
Platte River (2)	20.6	20.6	37.4	54.9	62.2	71.2	72.8	71.6	67.6	44.0	36 6	28 8	49.0
Princeton (1)	20.8	21.1	38.4	53.9	64 0	72.7	73.6	75.9	70.9	50.1	39.9	29.4	50.9
Rulo, Neb. (1)	24.6	23.0	43.3	58.6	66.6	73.7	77 4	.....	72 9	52.0	41.6	32.7	.....
Trenton	..	.....	.....	.....	59.8	67.6	69.7	70.7	70.2	51 0	38.6	30.6	.....
Mean of section	21.2	22 1	39.9	57.2	64.0	71.3	73.4	74.0	71.4	50.6	39.4	30.8	51.3
Dept. from normal	—1.8	—5.9	†2.3	†4.7	†2 2	—1.5	—3.3	†0.2	†4.8	—3.9	†0.4	—0.1	—0.1
Northeast section.													
Bluffton (1)	28.6	27.3	44.5	61.0	67.7	76.6	77.5	77.9	78.2	50.5	41.8	.....	.....
Gorin (2)	19.7	20.0	37.2	54.0	62.6	73.3	74.1	74.4	68.4	47.2	37.8	30.8	50.0
Hannibal	21.0	20.2	39.9	56.1	63.4	73.6	73.6	74.8	71.0	50.2	39 6	33.0	51.4
Keokuk, Iowa	19.6	18.8	38.0	55.1	63 6	73.3	73.8	75.7	70.7	50.0	38.6	31.0	50.7
Keosauqua, Iowa	18.4	18.4	38.6	54.3	62.7	72.2	74.0	75.4	71.3	50.6	38.1	29.2	50.3
McCune Station (1)	20.5	18.6	41.7	56.3	65.8	73.9	73.8	74.2	70.6	48.3	41.0	33.5	51.5
Marceline	.....	.....	.....	.....	.....	.....	.....	.....	70.3	49.6	39.0	30.9	.....
Mexico	21.2	21 3	41.4	57.6	65.5	74.4	74.8	75.8	72.0	50 8	40.8	33.6	52.4
New Hartford (2)	24.0	15.7	.....	58.7	.....	.....	.....	.....	.....	.....	.....	..	.....
Palmyra (4)	.....	.....	40.8	58.1	67.6	78.4	77.8	79.8	74.4	51.6	39.9	32.5	.....
St. Charles	24.5	23.8	43.8	57.0	64.7	74.9	74.8	76.0	72.9	55.0	43.5	37.8	54 1
Sublett	18.5	17.8	37.0	54.0	62.6	71.6	72.5	72.5	70.0	48.0	37.8	28.7	49.2
Unionville	17.8	21.4	37.8	55.4	65.0	73.0	75.0	75.8	70.2	44.3	35 7	27.4	49.9
Warrenton	25.4	24.2	43.0	58.4	65.3	74.8	74.1	75.9	71.8	50.8	41.6	35.1	53.4
Mean of section	21.6	20.6	40.3	56.2	64.7	74.2	74.6	75 7	71.3	49.8	39.7	32.0	51.7
Dept. from normal	—2.3	—9.4	†0.7	†2.6	†1 4	†1.7	—2.5	†1.4	†4.3	—4.4	—0.7	†0.6	—0.6
Central Section.													
Brunswick	21.8	21.9	41.1	59.4	66.5	73.7	76.3	76.1	71.6	52.8	39.2	33.2	52.8
Columbia	24.6	23.6	43.4	58.8	64.8	73.4	74.5	75.6	73.1	52.4	42.6	35.2	53.5
Darksville	25.2	21.6	40.6	57.6	67.3	72.2	73.8	74.9	.....	52.4	43.2	32.2	.....
Dixon	25.6	23 4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eldon (1)	26.0	25.2	42.7	58.6	62.6	72.4	72.7	75.8	73.4	53.6	44.4	36.8	53.7
Emma (2)	23.4	23.4	41.6	59.4	66 4	75.3	76.8	76.8	73.2	54.4	41.4	34.4	53.9
Fayette	23.4	22 6	42.4	59.0	65.2	73.7	74.2	75.0	73.6	53.6	41.5	34.0	53.2
Glasgow	23.2	21 0	40.6	57.9	63.9	73.0	73.7	75.0	72.6	51.4	39.5	31 5	51.9
Grovedale	.....	.....	.....	.....	.....	.....	.....	.....	72.9	50 1	42.0	36.3	.....
Hastain	24.8	25.2	44.6	59.3	66.2	74.2	75.3	76.1	73.6	52 3	43.4	37.0	54.3
Jefferson City	27.4	26.2	45.5	61.0	66.6	74.9	75.6	76.6	73.5	54.9	44 6	35.6	55.2
Lebanon	29.6	26.4	45.0	59.4	64.2	72.0	73.4	75 2	72.6	54.3	44.4	37.2	54.5
Linn Creek	27.6	25.4	45.4	61.2	64.8	74.8	.....	.....	.....	.....	.....	.....	.....
Marshall	22.2	22.6	41.2	58.2	65.4	71.4	73.8	74.6	73.2	51.0	39.8	32.0	52.1
Miami (1)	32.0	26.0	48.0	61.0	66.0	74.0	77.0	78.0	68.0	54.0	45 0	.....	.....
Phillipsburg (1)	.....	.....	.....	57.4	63.6	70.2	73.1	75.2	70.7	50.3	42.7	35.8	.....
Vermont (1)	23.5	23.0	41.1	55.8	63.2	71.3	73.1	73.4	72.8	.....	40.9	33.2	.....
Mean of section	25.4	23.8	43.1	58.9	65.1	73.1	74.5	75.6	72.4	52.7	42 3	34.6	53 5
Dept. from normal	—2.1	—8.8	†1.6	†3.6	†1.3	—0.7	—2.6	†0.4	+4.3	—3.6	†0.5	—0.2	—0.5

MEAN TEMPERATURE—Continued.

Station.	January	February	March	April	May	June.	July	August	September.	October	November	December	Annual
Southeast section.													
Birch Tree	30.0	27.4	46.5	59.8	64.4	73.2	74.5	75.0	70.8	50.6	42.8	37.9	54.4
Cairo (Ill)	31.5	28.4	46.9	60.3	66.4	77.2	76.0	78 1	74 5	54.6	46.6	40.0	56.7
Corning, Ark	31.6	28.2	45 8	61.5	67.6	76.6	77.7	79 0	73.8	51.8	46.0	39.3	56.6
Edge Hill (4)	30.6	26.6	44.4	59.0	65.4	73.4	73.0	74.2	71.0	51.6	43.3	39.0	54.3
Fox Creek (1)	25.2	24.4	42.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gayoso (2)	31.2	26.6	44 0	57.0	64.6	76.8	76.9	78 6	75.2	.....	43.4	37.7	.....
Gordonville (2)	28.6	24.9	44.2	57.4	62.8	72.5	74.0	73.6	70.6	47.6	42.2	37.6	53.0
Houston	26.0	25 1	44 8	56.9	62.0	73.8	75.1	74 5	70.8	51.2	43.8	39.6	53 6
Ironton (1)	27.9	25 2	44.0	57.5	63.7	72.7	72.4	72.9	70.2	48.4	41.6	37.1	52.8
Marble Hill	.....	.....	.....	.....	.....	74.4	75.1	75.4	70.4	51.4	43.1	37.0	.....
Mine LaMotte	28.9	26.0	44.5	58.0	63.0	72.1	73.1	73.8	71.0	50.2	43.8	38.0	53.5
New Haven (1)	25.8	25.2	42.2	57.4	64.0	73 6	74.2	74.9	74.5	55.0	45.3	39.6	54.3
New Madrid	34.7	32 6	50.6	63.2	69.2	79.6	78.0	80.5	77.6	56.5	49.4	43.7	59.6
Oakfield	25.6	24 8	44.2	59.4	65.6	75.4	75.0	76 2	72.1	52.0	41.8	36.8	54.1
Oak Ridge (3)	29 6	26 0	44.8	59.6	66.3	72.2	76.0	76.0	73.4	50.2	43.6	37.8	54.6
Olden	32.4	29 3	47.4	60.6	65.0	73.6	75.5	76.7	72.7	.....	.....	.....	.....
Poplar Bluff	34.5	29.8	48.2	61.2	67.0	75.4	75.8	77.7	73.7	54 9	45.6	40.0	57.0
Potosi	25.6	23.1	40.8	55.8	62.7	72 8	73.2	72.5	68.6	46.9	39.4	35.0	51 4
St. Louis (*a*)	26.2	25.1	44.1	59 8	66.6	77.1	76 4	77.9	74.1	53.6	43.2	37.0	55.1
St. Louis (*b*)	28.9	22.5	42.4	57.2	63 9	73.8	73.5	74.8	71.1	48.8	40.9	36.0	52.4
Sikeston	.....	27 3	46 9	60.6	67.2	.....	.....	.....	.....	55 8	48 0	.....	.....
Willow Springs	.....	24.9	43.4	59 2	64 6	74.4	74.8	77.4	74.4	55.8	46.2	40.4	.....
Zeitonia (1)	.....	.....	.....	.....	.....	.....	.....	73.2	70.1	48.1	41.6	37.3	.....
Mean of section	28.9	26.4	44.9	59.1	65.1	74 5	75.0	75.9	72.4	51.7	43 9	38.3	54.7
Dept. from normal	—2.8	—9.8	†0.9	†1 9	†0.8	†0.2	—2.1	†0.8	†4.1	—4.6	†0.4	†1.4	—0.7
Southwest section.													
Appleton City	26 8	25.8	44.2	58.8	65.8	74.8	75.7	76.0	72.8	.....	43.4	38.8	.....
Arthur (2)	22.1	21.2	38.5	55.5	62 6	72 2	73 1	73.8	68.6	44.8	.....	.....	.....
Columbus, Kan	27 2	25.0	43.6	58.7	66 0	74.8	76.1	76.1	71.7	.....	.....	34.8	.....
East Lynne (2)	20.8	20.4	37.2	53.4	61.0	70.2	71.4	72 2	67.8	45.4	39.0	32.4	49.3
Eight Mile (1)	24 0	24.0	41.2	56.8	62.3	70.1	72.4	72.5	69.5	50.6	41.4	33.2	51.5
Half Way	27.2	25 0	44.8	58.6	63 8	72.8	74.0	75.0	72 0	51.0	42.6	36.0	53.6
Harrisonville	22 8	24.8	44.8	60.8	65.6	72.2	73.2	74.8	74.1	51.6	40.2	31.2	53 0
Humansville	25.8	.....	.....	58.4	65.0	74.5	75 8	75.4	71.7	52.0	43.4	36 4	.....
Keesee's Ferry, Ark	32.6	29.5	48.8	61.8	67.2	74.9	76.2	77.2	74.4	54.2	46.3	41.2	57.0
Lamar	27.6	25.2	45.1	59.4	65.4	73.8	75 6	76.0	72.1	52.8	43.0	37.0	54.4
Mineral Spring	31.5	30·3	50.5	62.2	61.4	71.6	73.8	75.2	71.9	54.4	47.0	40.3	55.8
Mt. Vernon	27.2	22.8	41.1	54.2	61.4	70.8	74 1	74.6	71.4	50.2	40.4	34.6	51.9
Neosho	28.8	25 8	46.4	59.0	67.1	73.5	76 7	.....	.....	53.4	44.1	38.4	.....
Peirce City (1)	.....	.....	43.4	58.4	65.5	74.6	75.7	76.3	71.6	.....	.....	.....	.....
Sarcoxie (2)	26.4	23.8	42.8	58.1	65.2	73.6	74.8	75.8	70.8	48.2	41.0	33.8	52.9
Springfield	27.6	25.2	44.2	58.5	63.4	72.6	73.0	74.8	71.4	53.0	43.4	36.2	53.6
Warrensburg (1)	25 6	26.0	42.8	59.3	64.9	73.8	75.1	78.2	73.4	53.2	42.0	35.5	54.2
Windsor	27.0	25.3	43.3	58.8	63.5	71.0	73.2	74.0	72.3	53.5	41.7	35 2	53.2
Mean of section	26.5	25.0	43.7	58.3	64.3	72.9	74.4	75.2	71.6	51.2	42.6	35.6	53.4
Dept. from normal	—2.7	—9.8	†0.6	†1.7	—0.3	—1.2	—3 4	—0.4	†2.6	—6.0	—0.4	—0.1	—1.7
Mean for State	24.7	23.6	42.4	57.9	64.6	73.2	74.4	75.3	71.8	51.2	41.6	34.3	52.9
Dept. from normal	—2 4	—8.7	†1.3	†2.9	†0.9	—0.3	—2.7	†0.5	†4.0	—4 5	†0.1	†0.4	—0.7

NOTE.—A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus: (1) mean of 7 a. m. 2 and 9 p. m. (2) mean of 7 a. m. and 7 p. m (3) mean of 6 a. m. and 6 p. m. (4) mean of 7 a. m. and 2 p. m. The absence of a numeral indicates that the mean temperature was obtained from daily readings of the maximum and minimum thermometers.

† Above. — Below.

MONTHLY AND ANNUAL PRECIPITATION—1895.

Missouri Weather Service.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Northwest section.													
Akron	.....	0.44	1 66	2.72	2.99	7.89	6.45	6.37	1.31	0.13	1.27	2.83	.....
Atchison, Kan.	0.96	0.56	0 83	2.48	1.77	3.66	7 37	9.88	0.73	0.20	1.71	2.56	32.71
Bethany	0.84	0.57	1.05	1.48	3.69	5.54	4.23	9.42	0.26	0.12	1.50	2.48	31.18
Carrollton	0.60	0.57	1.44	1 10	4.97	8.94	7.41	4 70	2.13	0.60	3.46	5.51	41.43
College Sp'gs, Ia	.....	1.09	1.10	2.74	3.49	7.94	8.64	.....	.....	.....	.....	0.94	.....
Conception	0.30	0.44	0 26	2.29	2.06	6 72	5.75	8 56	0 47	0.05	0.88	1.66	29.89
Cowgill	0.40	0 27	0 36	1.18	3.90	5 85	6 26	4.28	0.82	0.28	1.37	5.14	30.11
Elmira	0.85	0.61	1.56	1.27	2.89	6.46	6.52	5 45	0 58	0.30	2.49	4 42	33 40
Fairport	0 90	0 70	0.66	1.24	2.55	5.22	6.62	7 61	0.66	0.20	1 58	3.05	30 99
Farmersville	0.92	0.67	0 65	1.46	3.24	4.95	5.31	8 99	0.99	T	2.44	3.79	33.41
Gallatin	0.93	0 64	0.79	1.97	5.24	7 40	4.87	8.07	1.36	0 31	1.78	3.63	36.99
Kansas City	0 32	0.59	0.95	1.19	3.88	7.72	9.64	7 21	1 43	0 12	3.05	5.12	41.22
Kidder	1.15	0 67	0 86	1.59	3.75	7.05	5 41	9.92	1 55	0.86	2.42	5 40	40.13
Langdon	0.17	1.10	0.68	2.14	4 63	4.82	3.16	9.47	.....	.....	.....	.....	.....
Lexington	0.73	0 84	1 28	1 71	7.48	9.47	5.09	4.86	0.86	0.19	3 28	5 66	40.95
Liberty	0.41	0.40	0.68	0.86	4.64	7.21	5.42	7.39	0.41	0.26	2.39	4.64	34.71
Maryville	0 41	0.88	0.38	2.47	2.89	7.30	3.76	6 51	0.25	0.10	0.52	1.28	26.75
Neb. City, Neb.	0 15	0.75	0.99	4.45	1.47	5.42	8.10	6.15	1.10	.....	0.82	0.30	.....
Nemaha, Neb.	0.40	1.20	0.72	3 61	4.92	5.36	3.59	6.44	0.80	0.20	1 30	0.60	29.14
Oregon (a)	0.93	0 96	0.74	2 37	3.04	5.17	2.96	8.06	0.32	0.24	0.94	1.75	27.48
Oregon (b)	0 83	0.91	0 80	2.14	3.08	5.13	2.92	8 26	0.29	0 20	0.86	1.55	26.97
Pickering	0.53	1.43	0.64	1.79	3.23	6.41	5.92	6.13	0.38	0 11	1.74	1.46	29.77
Platte River	0.85	0.71	0.82	1 93	1 95	4.21	8.69	7.71	0.41	0.35	1.46	3.15	32.24
Princeton	1.40	T	1.72	3.01	3.09	6 47	7.56	6.31	2.41	T	1.83	2.98	36.78
Rulo, Neb.	0.55	0.90	0.75	2.09	1 48	4 04	5.36	5.61	0.39	.....	0.68	1.34	23.19
St. Joseph	0.52	0.37	0.19	2.19	1 72	4.00	6.53	8.14	0.97	0.26	1.01	1 73	27.63
Tindall	1.36	0.29	0.55	1.51	3 22	4.43	.....	5 41	1.60	.....	.....	2.85	.....
Trenton	....	.....	.....	.....	4.28	5.10	4 64	7.90	1.24	0 16	.....	3.80	.....
Vilas	0.45	0.65	1.01	2.75	2 47	8 86	4.12	5.07	0.76	T	1 39	1.98	29 51
Sectional average.	0.69	0.67	0.86	2.06	3.38	6.15	5.62	7.14	0.91	0.18	1.68	2.91	32.25
Dept. from normal	—0.66	—1.01	—1.41	—1.29	—1.66	†1.01	†1.41	†3.43	—2.22	—2.58	†0.05	†1.44	—3.49
Northeast section.													
Bluffton	0.89	.....	1.64	0.80	5.96	7.98	8.56	2.26	5.71	0.27	2 85	.....	.....
Downing	0.65	0.20	2.63	4.41	3.69	5.79	7.28	3 55	3 22	0 20	1.99	4.53	38.14
Gorin	1.21	0.17	2.34	4.11	5.65	4.78	4.33	3 74	3.25	0.32	2.72	5.01	37.63
Grafton, Ill.	0.38	0.38	1.58	1.30	2.59	2 96	7 51	1.92	2.78	0.53	4.61	7.23	33 77
Hannibal	1.57	0.39	1.77	1.95	6.23	3.92	8 01	4.86	2.69	0.36	4.40	5.98	42.13
Keokuk, Ia.	1.44	0.19	1 05	3.38	3.15	2.61	5 46	2.68	2.67	0.37	2.58	4.24	29.82
Kessaugua, Ia	1.00	0.02	0.76	2.28	5.05	2.15	5.31	4.29	3.27	T	1.14	3.02	28.29
Louisiana	1.30	0.60	2.27	1.73	3.76	2.82	9.22	5 03	3 14	0.37	.....	.....	.....
McCune station	0.85	1.50	3.70	1.11	5.64	4.15	13.29	5.86	3 08	0.28	4.78	7.93	52 17
Marceline	1.38	0.56	1.26	1.29	4.82	6.08	4 81	9.18	2.02	0.35	3.71	5.57	41.03
Mexico	1.06	0.61	3.11	1.47	6.26	5.68	8.01	2.81	5.35	0.15	4.86	8.13	47.50
New Hartford	1.65	0.80	2.06	0.53	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palmyra	1.52	0.42	1.65	3.03	5.70	7.05	7.70	5.34	2.50	0.33	4.70	6.42	46.36
St. Charles	1.30	1.12	1.24	0.52	3.68	2.79	7.59	2.33	2.17	9.41	3.34	6.32	32.76
Shelbina	1.00	0.40	1.70	0.70	4.20	6.30	9.50	5.30	0.57	0.20	3.40	6.90	40.17
Steffenville	1.50	0.46	1.18	3.42	4.95	6.29	6.54	5.79	3.35	0.53	3.19	5.05	42.25
Sublett	1.07	0.06	1.40	3.80	3.10	7.32	11.47	5 40	5.00	0.04	1.70	6.31	46.67
Unionville	1.25	0.59	1.23	3.54	2.40	7.46	4.09	5.71	3.21	0.10	1 51	5.42	36 51
Warrenton	1 19	0 27	3.71	0 30	5.70	7.53	6 71	1.78	4.98	0 33	3.20	8.23	43.93
Warsaw, Ill	.....	.....	1 29	1.63	2.66	3.08	4.29	.....	.....	.....	.....	.....	.....
Sectional average.	1.17	0.49	1.88	2.06	4.48	5.09	7.35	4.32	3.27	0.29	3.22	6.02	39.64
Dept. from normal	—0.39	—1 85	—0.42	—1.30	†0.32	†0.63	†4.09	†1.98	†0.05	—2.40	†0.88	†4.18	†5 77
Central section.													
Arlington	.....	.....	0.90	1.10	0.36	0 99	.....	.....	.....	....	.....	.....	.....
Bagnell	2.30	0.50	2:02	1 10	4.74	5.16	13.03	3.83	0.50	.....	.....	.....	.....
Big Piney	.....	.....	1.35	0 80	1.25	1.90	.....	.....	.....	.....	.....	.....	.....
Boonville	1.39	0.38	2.23	2 57	6.74	7.43	6.97	3.00	0 38	0.04	4.07	7.89	43.09
Brunswick	1.05	0.20	2 09	0.80	1.00	6.58	6.13	3.52	2.06	0.05	3 19	6.26	32.93
Columbia	1.23	0.31	3 41	1.04	6.09	5.78	4.93	2.30	1.48	0.25	4.19	7.82	38.83
Darksville	1.02	0 25	1.38	0.91	5.88	9.95	6.88	5.18	.....	0.40	3.35	5.72	.....
Dixon	1.70	0.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

MONTHLY AND ANNUAL PRECIPITATION—Continued.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Eldon	1 08	0.35	2.42	1.59	6.15	8 62	10.76	2.78	0.74	0.13	2.59	8.88	46.09
Emma	0.60	0.90	0.91	1 22	4 83	7.55	6.35	3.75	1.95	T	2.45	6.35	36.86
Fayette	1.03	0.54	2.03	1.23	4.22	7.79	6.16	2.62	0.68	0.08	4.35	7.51	38.29
Fulton	1.00	0.25	3.10	2.25	5.20	4.60	8.50	1.67	4.45	0.38	3 07	10.35	44 82
Glasgow	0.85	0 40	1.39	0 83	4 56	5.82	5.63	2.90	0.78	0.14	3.94	7.50	34.74
Glensted	2.81	0 05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grovedale	1.80	0.98	2.21	2.94	4.50	5.18	7.87	5.65	1 47	0.52	3.23	8.43	44.76
Hastain	1.97	1.23	2.53	1.21	4.62	5.03	5.75	3 45	0.83	T	3.31	9.72	39.65
Houstonia	1.64	1.31	2.15	1.78	4.55	6.27	4.26	2.37	1.53	0.13	3 69	7.26	36.94
Jefferson City	1.70	0.44	2.75	2.22	6.98	5.36	8.90	3.10	1 45	0.35	2.15	9.20	44.60
Lamonte	0 90	0.28	1.57	2.27	4.86	6.66	4.05	2.98	1.04	0.23	3 99	7.98	36.81
Lebanon	1.85	0.39	3.25	2.64	6.13	5.91	7.70	3.63	1 37	0.20	3.44	12.07	48.58
Linn Creek	1.30	0.16	1 71	1 00	3.37	4.26	.....	.....	.....	.....	.....	.....	.....
Marshall	1.15	0.51	1.20	1.18	4.48	6.57	4.75	2.53	1.06	0 05	4.01	6.13	33.60
Miami	1.35	0.50	3.38	0.93	3.08	6.83	6.39	3.15	1.45	0.35	4.35	.....	.....
New Palestine	1.12	0.12	2.43	2.31	5.29	6.08	6.10	2.28	0.82	0.19	3.51	6.71	36.96
Phillipsburg	.....	.....	.....	2.04	3.86	6.89	7.75	3.34	2.24	0.29	2.88	13.67	.....
Rolla	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.55	.....
Vermont	1.67	0.27	1.76	1.11	6 08	5.32	5 64	2.19	1.60	.....	4.68	7.44	37.76
Versailles	.....	.....	.....	1 27	7.79	5.48	7.28	1.63	0.66	.....	.....	.....	.....
Wheatland	1 58	0.64	2.80	1.55	5 22	6.59	5.96	1.88	1.35	0.58	4.17	9.34	41.66
Sectional average	1.42	0.47	2.13	1.54	4 69	5 95	6 86	3.03	1.86	0.20	3.55	8.28	39.48
Dept. from normal	—0.35	—2.14	—0.49	—2.67	—0.34	†1.14	†2.68	†0.11	—2.26	—1.83	†1.26	†6.42	†1.53
Southeast section.													
Birch Tree	2 10	0 43	3.42	2.33	2 20	9.49	14.51	2 76	2 04	0.81	4.95	6.02	51.06
Cairo, Ill	3 77	0.39	2.76	2.75	1.48	4.86	5.97	0.71	1.86	0.50	5.27	3.25	33.57
Centreville	.....	0.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chester, Ill	3 58	0.70	3 51	2.23	2 07	3 99	5.93	2.87	3.38	.....	.....	.....	.....
Corning, Ark	3.47	0.56	4.73	1.71	1.61	6.61	4.32	2.12	2.81	0.81	6.00	2.75	37.50
Edgehill	2 51	0 36	3.14	2.25	1.20	4.90	4.36	3.11	3.50	0 75	4.15	5.83	36.06
Fox Creek	1.50	1.25	2.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gayoso	5.82	0.46	5.47	2.13	3.24	2.22	5.85	3.18	2.86	.....	6.97	4.04	.....
Gordonville	3 51	0.43	3.82	3.63	2.19	5.70	5.29	1.35	2 65	0.73	6.80	4.51	40.61
Hermann	1.21	0 85	1.71	0.72	5.58	5.66	7.90	1 17	4.92	0.32	2.39	8.15	40.08
Houston	1 58	0 34	2.78	2.32	3 01	6.15	8.89	4.01	3.12	0.88	4.92	4.51	42 51
Ironton	2 60	0.62	3 30	1.82	0 97	5.37	5.45	2.48	3.30	0.85	4.81	6.20	37.77
Marble Hill	1.98	0.15	2.87	3.65	1.17	9 12	8.03	1.75	2 81	0.30	6.09	4.37	42.29
Mine LaMotte	2.26	0.22	2 98	1 68	2.19	6.34	4.37	2.70	4.21	0.64	4.38	4 02	35.99
New Haven	1.40	1.25	2.37	0.56	4.90	4.05	5 61	2.69	2 96	0.14	2.75	7.57	36.25
New Madrid	4.81	0 28	4.64	2.73	4.08	3.96	8 50	3.60	2.14	1.55	7.06	5 33	48.68
Oakfield	1.58	0 27	2.77	0.66	3 96	5 54	6.28	5 66	3.20	0.31	3.28	5.88	39.39
Oak Ridge	3.30	0 79	3.05	2.70	0.85	6.80	5 95	2.52	3.05	0.25	5.61	3.77	38.64
Olden	1.76	0.35	3 50	3.44	3.37	5.80	6.90	4 89	2.48	.....	.....	.....	.....
Poplar Bluff	3.09	1.60	3.43	2.90	1.21	6.63	6 40	1 65	1.08	0.27	4 90	3 81	36.96
Potosi	2.35	1.25	2 91	1.33	1 20	6 04	7.29	2.88	3.17	0.93	3.80	4.99	38.14
St. Louis (a)	1.66	0.43	2.82	0.46	3.16	2 46	7.26	2.08	2.01	0.23	3.98	4.66	31.20
St. Louis (b)	.....	0 43	2 92	0.83	3.30	2.61	8 01	2.46	2.01	0.31	3.35	5.29	.....
Sikeston	3.07	1.80	3.34	2.73	1.99	.....	.....	.....	.....	0.42	6.33	3 69	.....
Willow Springs	.....	0.55	5.38	2.28	3.69	5.57	6 46	3 26	5 42	0.96	4.21	7 40	.....
Zeltonia	.....	.....	.....	.....	.....	.....	.....	2.34	1.82	0.97	5.85	6.15	.....
Sectional average	2 68	0.64	3.35	2 08	2.55	5.45	6.80	2.71	2.90	0.62	4.90	5.10	39.78
Dept. from normal	—0.03	—2.66	—0.03	—1.82	—1.89	0.93	†2.36	—0.56	—0.22	—1.87	†1.30	†2.37	—1.12
Southwest section.													
Appleton City	1.10	0.65	1.82	2.72	5 03	9.47	5 75	2.81	0.58	0.32	4.64	8.45	43.34
Arthur	0.90	0.25	2 25	2.70	7.04	7.33	8.82	4.50	2.09	0.50	3.01	7.25	46 64
Carthage	1.24	0 34	1 98	0 64	5 61	.....	.....	.....	.....	.....	.....	.....	.....
Columbus, Kas	1.23	0.13	1.97	0.50	4.10	8 67	11 03	5 54	10.12	.....	.....	.....	.....
East Lynne	0.97	0.66	2.97	4.11	7.02	8 11	8.92	6 06	1.97	0.22	3.89	7.11	52.01
Eight Mile	1.18	0 91	1.42	3.62	6 45	6.61	7 52	5 66	1.89	0.17	4.11	6.02	45.56
Half Way	1 60	0.53	2 04	2.05	3 01	6.66	6.25	2.78	1 80	0.16	3.04	9 27	39.19
Harrisonville	0 72	1.13	1.84	2.49	8 49	6.47	9.13	7.30	1.80	0.18	3.92	5.52	48 99
Humansville	1.09	.....	.....	1.64	3 93	6 13	5.61	2.36	2.43	1 10	3 57	8.24	.....
Keesee's Ferry, Ark	2.73	0.27	3 22	1.58	3.28	7.93	6.71	2.19	3.11	0.80	3.63	7.42	42.87
Lamar	1.55	0 35	2 20	4.34	4 89	9.01	7.26	3 20	5 31	0.85	3 77	8.08	50.84
Mineral Spring	2.15	0 25	2.74	1.68	7.02	3.49	9.48	3.07	6.42	1.56	3.64	8.86	50.36
Mt. Vernon	2 01	0.47	3 38	1.05	6.02	4 55	5 81	2.76	4.21	0.07	3.70	12.52	46.55
Neosho	2.45	0 25	3 34	2.23	7.51	6 11	8.06	4 76	11.24	0.41	4.61	.....	.....
Nevada	1 17	0.31	2 88	0.98	3.61	4 82	7.25	4.68	4.36	0.33	3.22	8.43	42.04
Osceola	1.65	0.50	3.17	1.37	5.55	2 65	6.40	2.95	1 14	0.25	0.67	7 37	33.67
Oto	1.95	1 55	2.88	1 63	3 61	4.32	9 05	3 10	8.80	0.40	3.30	7.37	47.96
Peirce City	.....	.....	1.10	0.02	5.75	4.80	7 05	5.25	4 50	.....	.....	.....	.....

MONTHLY AND ANNUAL PRECIPITATION—Continued.

Stations.	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Sarcoxie	2.07	0.40	2.85	1.20	4.06	5 35	7.50	5.58	4.67	0.55	3 64	11.22	49 09
Springfield	2.33	0.81	4.70	1.10	3.54	3 87	7.86	4.57	3.66	0.78	3.22	11.02	47.46
Vera Cruz	2.27	0.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Virgil City	0.75	0.28	.....	2.20	4.97	6.77	5.58	3.68	1.45	0.39	3.20	8.81	.....
Warrensburg	0.85	0.32	1.76	2.79	3 45	6.23	3.55	1.47	0.58	T	3 89	7.44	32.33
Windsor	0.97	0.67	1.18	3.27	7.81	7 05	6 63	3.08	1.48	0.20	3.14	8.14	43.62
Sectional average	1.52	0.50	2.46	2.00	5 29	6.20	7 33	3 97	3.80	0.46	3 49	8.34	45.36
Dept. from normal	—0.35	—2.30	—0 09	—1.99	—0.08	†1 35	†2.88	†0.45	†0.27	—2.42	†1.17	†6.22	†5.11
State average	1.50	0.55	2.14	1.93	4.08	5.77	6.79	4.23	2 45	0.35	3.37	6.13	39.31
Dept. from normal	—0.35	—2.00	—0.48	—1.81	—0.73	†0 99	†2.88	†1.08	—0.87	—2 22	†0.93	†4.13	†1.57

† Above. — Below. "T" indicates amount too small to measure.

TABLE SHOWING THE HIGHEST AND LOWEST TEMPERATURES

Recorded at Stations of the Missouri Weather Service during 1895.

(Data from maximum and minimum thermometers except where otherwise noted.)

Stations.	Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Year.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Appleton City.	70	-8	69	-15	86	10	88	35	91	38	95	54	98	54	93	57	95	32	78	22	76	9	69	6	98	-15
*Arthur	....	-10	....	-16	.....	11	....	36	....	46	.....	63	.....	60	.....	63	.....	33	.....	23	.....	....	.....	....	.....	-16
Atchison, Kas.....	70	-11	71	-16	91	4	87	30	94	37	94	49	98	49	92	55	96	32	89	20	78	7	60	3	98	-16
Bethany.....	66	-12	68	-22	88	3	88	25	94	33	93	50	98	47	96	53	96	28	81	17	77	3	58	0	98	-22
Birch Tree.....	65	-4	77	-12	86	15	88	32	87	36	93	48	98	56	92	54	93	34	79	21	73	13	62	6	98	-12
*Bluffton.	70	-5	70	-16	90	12	90	32	94	46	95	58	94	62	93	64	94	42	76	21	74	12	.....	.....	95	-16
Brunswick.....	64	-12	63	-20	84	5	97	30	92	38	90	51	93	55	95	52	94	35	77	18	75	5	60	4	97	-20
Cairo, Ill....	68	-2	74	-9	84	23	88	37	91	40	95	62	93	60	93	60	94	43	79	30	71	24	65	16	95	-9
Carrollton	64	-6	63	-13	83	7	88	32	90	37	90	57	95	54	92	57	94	37	77	26	74	9	63	6	95	-13
College Springs, Ia.	67	-13	67	-22	90	.....	85	14	98	33	91	50	96	45	.....	.....	.....	.....	.....	.....	.....	.....	60	1	.....	-22
Columbia	69	-7	71	-16	85	7	90	32	91	33	92	52	96	50	97	52	98	26	83	19	78	9	65	-4	98	-16
Conception	61	-11	66	-18	87	2	88	30	90	40	88	51	92	45	88	56	94	37	78	21	74	9	61	6	94	-18
Corning, Ark.....	68	-3	76	-8	82	20	93	33	97	36	99	49	99	56	98	.55	97	32	.....	.....	79	22	65	15	99	-8
*Cowgill.....	64	-10	66	-18	88	8	88	32	92	40	92	58	94	52	94	58	98	38	82	24	80	8	62	4	98	-18
Darksville	61	-10	65	-18	80	5	100	30	103	35	96	50	98	53	93	53	.....	.....	77	20	76	6	55	2	103	-18
Dixon.....	64	-6	66	-15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	-15
*East Lynne.....	....	-8	....	-19	....	8	....	30	....	36	.....	54	.....	57	....	58	88	35	.....	22	.....	6	.....	4	.....	-19
*Edge Hill.....	64	-4	72	-12	80	18	84	36	86	40	90	56	92	60	92	56	90	36	76	20	70	18	60	4	92	-12
*Eight Mile	64	-9	62	-18	86	8	86	32	89	36	88	58	93	55	93	57	92	32	76	23	72	8	60	6	93	-18
*Eldon.....	70	-4	66	-12	86	10	88	36	88	40	90	60	94	54	98	58	100	34	86	26	76	12	58	4	100	-12
Elmira	67	-19	68	-21	89	3	90	27	95	30	....	.....	99	46	96	48	100	24	86	16	80	2	62	-2	100	-21
*Emma.....	...	-6	....	-14	....	10	.....	34	.....	42	90	60	.....	60	.....	64	.....	34	.....	26	74	10	.....	8	.....	-14
Fayette.....	65	-10	69	-18	86	5	91	31	90	36	94	52	95	52	95	54	98	35	85	23	78	8	64	1	98	-18
*Fox Creek.....	69	-6	68	-13	84	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	-13
*Gallatin	66	-10	65	-17	85	5	87	31	91	40	90	53	100	51	96	55	96	34	76	22	73	6	62	6	100	-17
*Gayoso	....	- 2	...	-8	.....	24	.....	32	.....	40	.....	56	.....	62	....	60	.....	44	.....	.....	.....	22	.....	14	.....	- 8
Glasgow.....	66	-10	68	-17	84	6	92	29	94	34	94	54	96	52	96	51	98	29	82	22	76	6	61	0	98	-17
*Gordonville.....	....	- 4	....	-11	....	23	.....	33	84	37	.....	55	.....	60	92	57	....	39	.....	24	.....	22	.....	7	.....	-11
*Gorin.....	...	- 7	..	-13	93	10	94	33	91	36	.....	61	98	55	100	55	102	35	83	23	77	11	.....	6	102	-13
Grovedale.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	.....	102	25	84	14	75	13	61	-7	102	.....
Half Way	70	-7	69	-19	85	10	86	31	89	35	90	49	93	52	93	55	93	28	78	18	73	13	64	0	93	-19
Hannibal.....	62	-10	65	-18	84	9	87	32	89	36	92	52	95	53	93	54	94	36	78	22	74	13	64	2	95	-18
Harrisonville...	69	-9	68	-16	92	8	91	33	93	39	93	51	95	54	95	55	100	35	81	21	76	8	65	2	100	-16
Hastain	69	-11	68	-23	87	9	91	31	95	36	96	48	101	52	97	55	96	28	78	17	72	10	66	1	101	-23
Houston.....	60	-8	69	-15	79	15	82	30	88	33	93	45	95	54	94	53	96	30	80	20	73	12	65	5	96	-15
Humansville.....	70	-8	...	.....	.....	.....	89	28	94	34	95	47	96	50	93	53	93	26	79	18	78	10	65	7	96	.....
*Ironton..	62	-3	74	-12	80	18	86	35	88	43	93	57	91	58	92	57	93	42	75	20	72	17	59	6	93	-12

HIGHEST AND LOWEST TEMPERATURES—Continued.

Stations.	Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Year.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Jefferson City	70	-4	70	-12	87	11	90	32	95	37	96	54	98	54	94	56	98	35	78	25	72	13	60	5	98	-12
Kansas City	65	-8	64	-12	88	8	85	33	90	39	91	54	95	54	93	59	96	37	80	26	75	10	63	6	96	-12
Keesee's Ferry, Ark.	72	-5	76	-11	91	11	91	30	92	37	98	47	97	55	99	56	99	33	87	21	76	16	64	6	99	-11
Keokuk, Iowa	61	-11	68	-22	84	8	88	31	90	35	92	52	96	54	94	58	95	36	77	20	73	7	63	2	96	-22
Kidder	63	-11	66	-19	86	4	88	26	94	34	94	50	97	49	96	55	95	31	79	18	75	3	61	-1	97	-19
Lamar	71	-6	68	-16	84	12	87	34	89	37	92	54	98	55	92	60	91	33	76	27	75	8	66	8	98	-16
Langdon	70	-12	69	-19	92	4	86	27	96	34	95	49	102	45	....	....	....	....	....	....	....	....	....	....	....	-19
Lebanon	70	-7	68	-17	88	10	87	35	89	39	90	53	91	57	90	59	93	31	82	23	77	15	61	2	93	-17
Lexington	64	-8	64	-16	87	7	90	30	90	37	90	53	94	53	93	55	95	34	81	23	77	8	63	5	95	-16
Liberty	66	-7	66	-13	91	8	92	33	94	37	95	54	100	50	97	55	98	34	83	25	76	8	65	6	100	-13
Linn Creek	69	-8	70	-18	85	7	91	33	95	35	94	55	....	....	....	....	....	....	....	....	....	....	....	....	....	-18
*McCune Station	64	-22	66	-23	86	8	89	35	93	32	95	61	95	55	93	54	93	38	79	19	78	14	63	-8	95	-23
Marble Hill	....	-4	....	-12	.....	16	.....	28	..	33	97	47	96	50	94	50	94	32	80	19	75	16	63	6	97	-12
Marceline	....	....	....	....	....	....	....	....	....	....	....	....	....	....	92	54	94	32	76	11	74	3	60	2	....	....
Marshall	65	-8	70	-17	85	5	97	30	94	34	94	44	97	49	97	.....	102	28	82	20	77	5	63	-3	102	-17
Maryville	66*	-12	61*	-20	85*	2	83*	28	96*	35	89*	47	100*	50	91*	53	95*	32	76*	16	72*	3	53*	1	100*	-20
Mexico	66	-9	69	-20	84	8	91	30	92	34	95	51	98	51	97	50	95	35	78	21	77	9	65	0	98	-20
*Miami	68	-4	62	-8	86	12	90	32	92	40	92	56	98	56	96	60	98	38	80	28	80	10	....	....	98	- 8
Mine LaMotte	63	-4	75	-12	81	17	85	29	88	33	91	47	90	55	90	51	92	34	75	20	72	19	60	2	92	-12
Mineral Spring	75	-5	72	-13	91	11	95	35	87	40	90	53	90	54	94	56	94	33	83	26	79	16	64	6	95	-13
Mt. Vernon	74	-9	68	-21	82	8	90	28	90	35	91	45	95	50	94	52	95	27	76	17	71	11	58	0	95	-21
*Nemaha, Neb	68	-12	65	-18	90	4	89	28	98	40	98	55	101	55	98	59	100	29	74	16	75	0	58	2	101	-18
Neosho	73	-6	69	-18	88	11	92	32	93	36	94	52	101	53	104*	62*	97*	32*	81	20	75	11	66	2	104	-18
*New Hartford	70	-8	....	-21	....	14	....	25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	-21
*New Haven	65	-2	70	-9	85	17	88	30	93	38	96	56	96	58	96	56	95	46	76	29	74	22	64	10	96	- 9
New Madrid	66	2	75	-5	83	26	91	36	95	40	100	55	98	60	99	57	97	39	80	29	75	21	67	15	100	- 5
Oakfield	67	-7	69	-14	85	11	89	33	92	35	96	55	96	55	95	58	93	37	75	25	75	12	62	5	96	-14
*Oak Ridge	....	-4	....	-11	....	20	92	37	....	43	99	56	98	60	....	59	98	40	....	27	.....	26	.....	10	....	-11
Olden	64	-4	74	-13	87	15	88	33	87	37	94	50	96	52	94	56	95	37	....	....	....	....	....	....	96	-13
Oregon (a)	70	-12	69	-18	91	4	85	31	95	38	91	51	98	50	94	57	98	33	81	21	78	6	62	1	98	-18
Oregon (b)	67	-13	68	-19	91	3	87	29	96	37	90*	50	98*	48	94*	55	98*	32	80*	19	76*	5	60*	1	98	-19
*Palmyra	....	....	....	-20	80	6	90	30	94	34	94	54	98	60	96	58	96	38	76	24	78	8	60	0	98	-20
*Phillipsburg	....	....	....	....	85	....	84	35	86	42	89	54	92	57	93	64	93	32	79	25	73	17	61	-2	93	....
*Pickering	....	-18	70	-24	98	0	....	28	....	28	....	50	105	48	102	54	102	28	82	18	74	6	62	0	105	-24
*Peirce City	..	....	....	....	82	8	88	32	92	34	100	60	98	62	95	60	96	32	....	....	....	....	....	....	100	....
*Platte River	64	-6	70	-16	84	6	88	28	90	38	94	54	92	52	97	56	94	26	76	22	74	10	62	4	97	-16
Poplar Bluff	68	-1	77	8	83	19	88	33	94	40	95	54	95	56	95	57	97	34	84	21	74	19	68	12	97	-8
Potosi	63	-8	75	-16	84	11	88	24	94	26	98	46	96	49	92	46	92	30	76	16	72	6	61	-4	98	-16
*Princeton	62	-12	68	-18	86	3	90	28	96	36	96	52	101	47	98	50	96	29	78	20	76	3	60	2	101	-18
*Rulo, Neb	72	-9	72	-15	90	4	86	34	100	45	96	54	102	58	....	....	100	33	83	21	78	8	60	5	102	-15
St. Charles	67	-8	66	-14	85	14	88	35	90	35	94	55	94	54	96	54	97	35	83	22	78	14	62	5	97	-14

St. Louis (a)	64	-8	70	-12	85	15	89	35	94	40	96	60	96	60	94	58	95	42	77	30	76	16	61	7	96	-12
St. Louis (b)	....	-6	70	-16	84	25	87	32	90	32	94	49	94	52	93	54	94	36	78	20	76	6	61	6	94	-16
*Marceline	78	-6	68	-19	92	10	92	36	95	40	.....	60	101	62	98	66	98	38	80	25	78	17	62	4	101	-19
Sikeston	62	-5	75	-10	83	21	91	30	97	34	.....	.....	.....	.....	.....	.....	.....	.....	86	24	75	23	72	12	.....	-10
Springfield	70	-12	66	-17	86	10	84	34	86	40	89	56	91	55	91	59	92	37	76	28	70	16	60	4	92	-17
Sublett	63	-17	67	-20	85	1	87	24	91	30	93	46	94	48	90	48	91	30	76	16	74	2	60	0	94	-20
Trenton	.....	.....	.....	.....	.....	.....	.....	.....	.....	37*	.....	54*	.....	52*	.....	57*	97	.....	75	22	71	6	60	5	.....	.....
Unionville	68	-13	75	-19	87	0	95	26	96	34	97	42	100	52	104	50	97	30	81	15	81	-4	47	0	104	-19
*Vermont	67	-7	67	-14	86	7	90	34	90	39	90	54	94	59	93	58	97	30	.....	18	74	10	66	2	97	-14
*Warrensburg	70	-5	66	-9	86	10	89	35	90	46	90	62	96	62	100	62	95	39	79	26	72	13	64	9	100	-9
*Warrenton	68	-8	69	-15	87	7	86	32	92	37	96	55	96	54	92	57	93	35	76	25	72	12	62	3	96	-15
Willow Springs	....	...	67*	-16	88*	12	87*	31	89	36	97	49	97	52	103	53	104	36	89	23	82	6	61	4	104	-16
Windsor	70	-15	72	-26	88	5	89	31	95	37	89	50	96	52	96	52	100	32	85	20	77	4	63	1	100	-26
*Zeltonia	....	...	....	..	.....	.....	.....	... .	.....	.....	. ....	.....	.....	.....	98	56	101	41	79	29	71	20	53	12	.....	..
For the State	78	-22	77	-26	98	0	100	24	103	26	100	42	105	45	104	46	104	24	89	14	82	-4	72	-8	105	-26

* Data from observed readings. Dash (—) indicates below zero.

MONTHLY AND ANNUAL SNOWFALL—1895.

Missouri Weather Service.

(Inches and tenths).

Stations.	January	February	March	April	October	November	December	Annual
Northwest section.								
Akron	.....	2.5	4.5	0	0	2 5	8 0	.....
Atchison, Kansas	3.7	1.5	1.5	T	T	0.1	9.2	16 0
Bethany	5.0	3.0	3.2	0	0	0.8	6 0	18.0
Carrollton	5.0	5.5	5.0	0	0	2.0	5 0	22.5
College Springs, Iowa	..	2.5	6.5	1.0	....	0.9	.....	.....
Conception	3.0	0.2	2.0	T	0	T	4 5	9 7
Cowgill	4 0	1.2	1.5	0	0	2.0	2.0	10.7
Elmira	6.5	3.5	2 1	T	T	1.0	2.8	15.9
Fairport	4.0	4.0	1.5	0	0	T	9.0	18.5
Farmersville	6.2	3.0	2.0	0	0	1 0	4 6	16.8
Gallatin	6.0	3.2	1.6	0.5	0	0 8	3.5	15.6
Kansas City	3.3	2.9	5.1	0.4	T	3.8	11.5	27.0
Kidder	7.4	3.4	2.6	2.5	0	1.7	5.5	23.1
Langdon	2.0	T	1.0	T	....	.....	.....	.....
Lexington	7.0	2.5	6.2	0	0	2 5	4.8	23 0
Liberty	3.5	1.0	5.5	T	T	2 5	5.0	17.5
Maryville	4.1	2.2	3.8	T	0	0.2	6.6	16.9
Nebraska City, Nebraska	3.3	0.5	1.1	0.2	.....	1 0	0.7	.....
Nemaha, Nebraska	4.0	2.0	1.2	.....	....	1.0	4.0	.....
Oregon *(a)*	6.3	4.2	3.6	0.3	0	0.4	8.5	23.3
Oregon *(b)*	6.6	3.1	3.4	T	T	0 2	7.7	21.0
Pickering	5.8	5.1	3.8	0.2	T	0.2	7.2	22 3
Platte River	5.5	4.5	3.0	1.5	0	0 5	8.0	23.0
Princeton	7 0	T	1.5	0	0	2.0	3.5	14.0
Rulo, Nebraska	5.5	3.0	3.5	0	0	T	7.0	19.0
St. Joseph	2.8	2.0	1.0	0	0	T	4 5	10.3
Tindall	9.0	1.2	0.5	0	0	.....	1 0	.....
Trenton	.....	.....	.....	.....	0	.....	0	.....
Vilas	4.5	1.6	4.0	0	0	0.2	7.8	18.1
Sectional average	5.0	2.5	2.9	0.2	T	1.0	5.5	17.1
Northeast section.								
Bluffton	7.0	.....	2.5	0	0	5.0	.....	.....
Downing	6.5	2.0	2.5	0 5	0	0.5	0.8	12 8
Gorin	10.5	0.8	5.6	T	0	0	T	16.9
Grafton, Ill	3.6	3 2	9.9	0	0	7.5	.....	.....
Hannibal	15 4	2.4	2.7	0	0	4.7	1.2	26.4
Keokuk, Ia	11 7	1.8	5 3	T	0	3.7	0.9	23.4
Keosauqua, Ia	10 0	1 5	5.0	T	0	2 0	.....	.....
Louisiana	12 0	6.0	5.0	0	0	.....	.....	.....
McCune Station	10.5	10.2	6.5	0	0	8.0	1.4	36 6
Marceline	10.0	5.5	1 0	0	0	3.0	1.0	20 5
Mexico	9.7	2.7	9.0	0	0	6 0	2.4	29 8
New Hartford	8.0	7 9	....	0	....	.....	.....	.....
Palmyra	12.8	2.8	6.0	0	0	7 0	2 0	30.6
St. Charles	6.1	5.2	6.8	0	0	6.2	1.0	25 3
Shelbina	12.0	2 0	2.0	0	0	5.0	1.0	22.0
Steffenville	14 5	4.0	3 0	T	0	3.8	T	25 3
Sublett	10 5	0 6	1 5	0	0	1 5	3.1	17 2
Unionville	9.2	5 0	8.1	0	0	2 2	7.4	31 9
Warrenton	5.0	2 8	8 5	0	0	10 0	.....	.....
Warsaw, Ill	.....	.....	5.3	0	....	.....	.....	.....
Sectional average	9.7	3.7	5.1	T	0	4.5	1.7	24.7
Central section.								
Arlington	.....	....	6.0	0	.....	.....	....	.....
Bagnell	15.0	4.0	11.0	0	0	.....	.....	.....
Big Piney	.....	.....	8.0	0	.....	.....	.....	.....
Boonville	6.0	1.9	8.4	0	0	4.1	4.1	24.5
Brunswick	6.0	1.1	1.2	0	0	T	0	8.3
Columbia	9.9	4.2	10.3	0	0	6.0	2.3	32.7
Darksville	7.8	2.5	5.5	0	0	2.0	0.7	18.5
Dixon	10.5	1.5	....	....	.....	.....	.....	.....
Eldon	10.5	3 5	4.0	0	0	4.0	0.2	22.2
Emma	6.0	9.0	9.0	0	0	2.0	2.0	28.0
Fayette	8.6	4.5	7.8	0	0	4.0	2.0	26.9
Fulton	10.0	2.5	6.0	0	0	5.0	1.0	24.5

MONTHLY AND ANNUAL SNOWFALL—Continued.

Stations.	January.	February.	March.	April.	October.	November.	December.	Annual.
Glasgow	8.0	0.9	6.5	0	0	4.0	1.8	21.2
Glensted	12.0	0.5	.....	.....	.....	.....	.....	.....
Grovedale	14.7	8.0	10.6	0.6	0	5.0	5.6	44.5
Hastain	15·5	6.6	6.5	0	0	4.0	1.0	33.6
Houstonia	10.4	5.8	12.2	0	0	2.6	4.4	35.4
Jefferson City	11.0	3.2	4.5	0	0	6.0	1.0	25.7
Lamonte	9.0	2.8	10.8	0	0	2.5	1.8	26 9
Lebanon	11.4	2.8	4.0	0	0	3.0	1 1	22.3
Linn Creek	8 0	1 8	6.2	0	.....	.....	.....	.....
Marshall	11.0	4 3	5.8	0	0	4.0	3.6	28.7
Miami	7.2	6.0	12.5	0	0	3.0	.....	.....
New Palestine	11.0	1 2	9.2	0	0	4.0	0 2	25.6
Phillipsburg	.....	.....	.....	0	0	3.0	0.2	.....
Rolla	.....	.....	.....	.....	.....	.....	2.7	.....
Vermont	11 7	2.7	T	0	0	5.0	1 0	20.4
Wheatland	14.3	6.2	5.8	0	T	4.0	1.2	31.5
Sectional average	10.2	3.6	7.2	T	T	3.7	1.8	26.5
Southeast section.								
Birch Tree	9.5	T	0.5	0	0	1 0	2 5	13.5
Cairo, Ill	15.1	3 7	0.1	0	0	0	10.7	29.6
Centreville	.....	2.4	.....	.....	.....	.....	.....	.....
Chester, Ill	10.0	7 0	9 5	0	.....	.....	.....	.....
Edgehill	8.0	4 9	5 1	0	0	1.2	3.5	22.7
Fox Creek	11.0	4.5	10 5	....	0	.....	.....	.....
Gayoso	7.0	1 0	0	0	0	0	6.0	14.0
Gordonville	12.0	3.5	0.8	0	0	T	7.8	24.1
Hermann	10 0	3 5	4.4	.....	0	4 0	.....	.....
Houston	10 0	3.0	2.0	0	0	5 0	T	20.0
Ironton	9 5	6 0	3.0	0	0	1.0	5.5	25 0
Marble Hill	11.0	1.5	T	0	0	0	5.5	18.0
Mine LaMotte	10.5	3.0	2.5	0	0	0 5	7.5	24.0
New Haven	14 0	5 0	6.5	0	0	9.0	1 0	35.5
New Madrid	10.0	2.3	T	0	0	0	14.6	26.9
Oakfield	9.2	3.5	9.0	0	0	6.2	2.5	30.4
Oak Ridge	18.0	1.1	1.6	0	0	0 3	7.5	28 5
Olden	8.4	1.0	0 5	0	.....	.....	.....	.....
Poplar Bluff	7.0	2 5	T	0	0	0	5 0	14.5
Potosi	14 0	12.0	4.1	T	0	3 0	8 0	41.0
St. Louis *(a)*	8.1	3.7	9.1	T	0	4 0	3.5	28.4
St. Louis *(b)*	.....	.....	.....	0	0	6.0	3.0	.....
Sikeston	12.5	2.8	T	0	0	0	10.0	25.3
Willow Springs	.....	1.0	T	0	0	4.5	1.2	.....
Zeitonia	.....	....	.....	....	0	0.6	5.2	.....
Sectional average	10.7	3.4	3.0	T	0	2.2	5.5	24.8
Southwest section.								
Appleton City	11.0	4.0	3.0	0	0	.....	1.0	.....
Arthur	9.0	2.5	.....	0	0	3.0	5.0	.....
Carthage	10.0	3.4	0.5	0	.....	.....	.....	.....
East Lynne	9.1	2.0	12.5	0	0	3.0	4.0	30.6
Eight Mile	11.4	5.0	11.5	0	0	3.5	5 0	36.4
Half Way	12.5	4.0	1.5	0	T	4.0	1.0	23.0
Harrisonville	8.0	1.7	10.0	0	0	2.0	5.0	26.7
Humansville	10.9	.....	.....	0	0	3.0	1.0	.....
Keesee's Ferry, Ark	9.8	0.2	T	0	0	2.0	0.2	12.2
Lamar	15.5	3.5	0.8	0	0	3.0	T	22.8
Mineral Spring	11.5	1.5	T	0	0	2.5	1.8	17.3
Mt. Vernon	12.5	4.5	1.5	0	0	3.5	1.5	23.5
Neosho	9.5	2.0	0.5	0	0	4.5	1.2	17.7
Nevada	11.5	3.1	1.0	0	0	4.0	6 0	25.6
Osceola	14.0	5.0	4.0	0	0	2.7	4.2	29.9
Oto	13.3	3 5	0.8	0	0	3.0	0.8	21.4
Peirce City	.....	.....	1.0	0	.....	.....	.....	.....
Sarcoxie	14.3	4.0	0 6	0	0	3.0	2.2	24.1
Springfield	16.0	5.7	1.5	0	0	6.0	3.0	32 2
Vera Crus	10.2	0 5	.....	.....	0	.....	.....	...
Virgil City	7.5	2.2	.....	0	T	3.0	2.0	.....
Warrensburg	8.2	2 5	11.0	0	0	4.0	0.2	25.9
Windsor	9.5	6.7	9.3	0	T	3.0	0.4	28.9
Sectional average	11.1	3.2	3.7	0	T	3.3	2.3	23 6
State average	9.3	3.3	4.4	T	T	2.9	3.4	23.3

"T" indicates amount too small to measure.

FROSTS.

The following table gives the dates of last killing frost in spring and first in autumn for the season of 1895, at stations of the Missouri Weather Service. In cases where the dates of frost were not recorded the date of the first and the last occurrence of a minimum temperature of 32 degrees (freezing) is given. These dates are indicated by an asterisk (*).

Stations.	Last in spring.	First in autumn.
Akron	May 12	Sept. 30
Appleton City		Oct. 9
Arthur		Sept. 30
Atchison, Kan	April 2	" 30
Bethany	May 12	" 29
Birch Tree	April 3*	Oct. 13
Bluffton	" 3*	" 9
Brunswick	" 3*	" 9**
Cairo, Ill	March 21	" 20
Carrollton	May 17	Sept. 23
Carthage	" 3	
Columbia	April 3	Sept. 30
Conception	" 3*	Oct. 9*
Cowgill	" 3*	Sept. 30
Darksville	May 13	Oct. 1
Downing	" 14	" 9
East Lynne	April 3*	Sept. 30
Edgehill	May 14	" 30
Eight Mile	April 3*	" 30
Eldon	March 21*	Oct. 9*
Elmira	May 17	Sept. 29
Emma	" 12	Oct. 28*
Fairport	" 15	Sept. 30
Farmersville	" 12	" 30
Fayette	April 3*	" 30
Fulton	" 3	Oct. 7
Gallatin	" 3*	" 9
Gayoso	" 3*	" 2
Glasgow	May 17	Sept 30
Gordonville	" 14	" 30
Gorin	" 14	Oct. 9
Grovedale	" 22	Sept. 30
Half Way	" 22	" 29
Hannibal	" 14	" 30
Harrisonville	March 21*	" 30
Hastain	April 3*	" 30
Houston	May 22	" 30
Houstonia	" 17	" 30
Humansville	April 3*	" 29
Ironton	May 23	" 30
Jefferson City	April 2*	Oct. 20*
Kansas City	" 3	Sept 30
Keesee's Ferry, Ark	May 12	" 30
Keokuk, Ia	April 14	Oct. 9
Kidder	May 12	Sept. 30
Lamar	March 21*	Oct. 9*
Lamonte		Sept. 29
Langdon	April 4*	
Lebanon	March 21*	Sept. 30
Lexington	April 2*	" 30
Liberty	March 26*	" 30
Linn Creek	" 26*	
McCune Station	May 14*	Sept. 30
Marble Hill	April 4*	" 30
Marceline	April 2	" 30
Marshall	April 3*	" 30
Maryville	May 13	" 30
Mexico	" 14	" 30
Miami	" 17	" 30
Mine La Motte	" 14	" 30
Mineral Spring	March 21*	" 30

FROSTS—Continued.

Stations.	Last in spring.	First in autumn.
Mt. Vernon	May 23	Sept. 30
Neosho	April 3*	" 30*
Nevada		Oct. 12
New Haven	May 22	" 20
New Madrid	March 21*	" 1
Oakfield	May 14	" 20
Oak Ridge	" 22	" 1
Olden	March 22*	Sept. 30
Oregon (*a*)	May 12	" 30
Oregon (*b*)	" 12	" 29
Osceola		" 30
Oto	March 21	" 29
Palmyra	May 14	Oct. 9*
Phillipsburg	March 21*	Sept. 30
Pickering	May 12	" 23
Peirce City	April 3	" 30*
Platte River	May 17	" 30
Poplar Bluff	March 21*	" 30
Potosi	May 14	" 30
Princeton	" 22	" 30
St. Charles	" 14	Oct. 9
St. Louis	" 14	" 20
Sarcoxie	" 23	Sept. 30
Shelbina	" 14	
Sikeston	April 2*	Oct 1
Springfield	" 3	Sept. 30
Steffenville	May 17	" 30
Sublett	" 14	" 30
Tindall	" 12	" 29
Unionville	" 14	" 30
Vermont	March 26*	" 30
Versailles		" 30
Vilas	May 14	" 30
Virgil City		" 30
Warrensburg	March 21*	Oct. 9
Warrenton	May 13	" 8*
Wheatland		Sept. 30
Willow Springs	April 3*	Oct. 20
Windsor	" 4*	Sept. 23
Zeitonia		" 30

GENERAL REVIEW OF THE WEATHER AND CROP CONDITIONS OF THE YEAR.

The month of January, 1895, averaged from 2 to 3 degrees colder than usual in all sections, and, while the precipitation for the month was slightly in excess of the normal in a few localities, there was an average deficiency for the State of .50 inch. Water for stock was very scarce in many places, and up to the 25th winter wheat had but little protection; but from that date to the close of the month the ground over the greater portion of the State was well covered with snow.

The early part of February was extremely cold, and, although the latter part was much warmer, the mean temperature for the month was 8.7 degrees below the normal for the State. The month was also unusually dry in all sections, the average precipitation for the State being only .55 inch—2.00 inches below the normal. Over the greater portion of the State wheat was well protected by snow during the severest weather, but peaches were injured considerably in many places, and in some localities were entirely killed. The melting of the heavy snows

that lay on the ground during the first decade, together with the light rains during the latter part of the month, increased the supply of stock water, but at the close of the month it was still scarce in some localities.

The mean temperature of the month of March was about normal in the southwest section, slightly above normal in the eastern sections, and about 2 degrees above in the central and northwest sections. From the 1st to the 21st the temperature was below the normal the greater part of the time, but during the remainder of the month the weather was unusually warm. The precipitation was deficient in all sections, but in the northeast, southeast and southwest sections the deficiency was slight. The greatest departure from normal occurred in the northwest section, where the rainfall for the month was only 38 per cent of the normal amount. In some counties of the northern sections wheat was somewhat injured by drouth and drying winds during the last decade, and water continued very scarce in many localities. But little farming was done before the 20th, but during the latter part of the month the soil was in good condition to work, except in a few localities in the central and southern sections where heavy rains and snows made it too wet, and by the 31st a large part of the oat crop had been sown, early gardens made and some plowing done for corn.

April averaged considerable warmer than usual in all sections, the mean temperature of the month for the State being 2.9 degrees above the normal. The last general killing frost occurred on the 3d, and, although killing frost occured at a few stations on the 4th, 8th, 14th, 19th, 22d and 23d, little or no damage was done. In the southern sections the average precipitation was about half the normal amount for April, in the northwest section a little over half, and in the northeast section about two-thirds, while in the central section it was only a little over one-third. The conditions during the month were very favorable for planting and the rapid advancement of farm-work, but in many counties grasses and small grains were seriously injured by drouth. Oat sowing and clover seeding were about completed during the first week, and corn planting was commenced in the central and southern sections. By the close of the second week stock were being put on pasture, flax was about all sown and corn planting had commenced in the northern counties. Cotton planting was commenced in the southeastern counties during the third week.

The first decade of May was unusually warm but during the remainder of the month, with the exception of the last few days, the weather was generally cool, the lowest temperature occurring from the 11th to the 14th, on the 16th and 17th and from the 20th to 22d. Kill-

ing frost occurred in portions of the State on the 11th, 12th, 13th, 14th, 15th, 16th, 17th, 22d and 23d, those of the 12th and 14th being the most destructive; corn, beans, potatoes, melons and other tender vegetation on low ground being killed or greatly damaged in many of the northern and eastern counties and in some localities fruit and wheat were also seriously injured. The precipitation for the month was about normal in the southwest section, slightly in excess in the northeast section and deficient in the remaining sections. The average precipitation for the State, 4.10 inches, was .71 inch below the normal. In nearly all sections of the State there were periods of drouth which injured crops to a greater or less extent and in some sections drouth continued practically unbroken throughout the month. In many counties, especially in the southern, central and northwest sections, wheat, oats and grasses were greatly injured and in some localities almost ruined. Heavy rains fell in many of the western counties on the 29th, 30th and 31st, however, effectually relieving the drouth in those sections. Corn came up well, as a rule, and was thoroughly cultivated, but its growth was much retarded by the low temperature of the second and early part of the third decade. Some replanting was necessary owing to frost and the ravages of cut worms. Chinch bugs did much damage to wheat in a number of counties and considerable damage by hessian fly was reported in some of the southern counties. Cotton in the southeastern counties escaped serious injury from frost and did fairly well. Severe wind and hail storms did much damage to crops, gardens and fruits in some localities.

The month of June averaged a little cooler than usual in the western sections while in the central and southeast sections the mean temperature of the month was about normal and in the northeast section about 2 degrees above. The precipitation was in excess of the normal in all sections and over a large part of the State the total for the month ranged from 6 to 9 inches. The long drouth was thoroughly broken and, although the rains came too late to be of very great benefit to the wheat crop, oats improved wonderfully, meadows thickened up, pastures revived and cisterns and stock ponds were filled. In many of the central and southern counties heavy rains during the last decade delayed farm work and caused considerable damage to grain in shock. High winds and hailstorms also did considerable damage to crops and buildings in a few localities. Wheat harvest commenced in the southern counties during the first week and was in progress in all sections by the 15th. Haying was commenced in some counties by the 20th. Corn was retarted by drouth in some sections during the early part of the month and in a number of counties was injured to some extent by

chinch bugs and cut and wire worms, but generally made rapid growth and by the last week of the month was beginning to silk and tassel. In some districts where heavy rains prevented cultivation it became very foul, but, as a rule, was in good condition. All other crops made good progress after the rains and by the 29th cotton was in bloom in the southeastern counties. Oat harvest was commenced in some localities by the 15th.

July averaged cooler than usual in all sections, the mean temperature for the State, 74.3 degrees, being 2.8 below the normal. Light frost occurred at Steffenville, Lewis county, on the 31st. Except in a few localities in the west-central and northwest portion of the State, the month was unusually wet, the average rain-fall for the State being 6.89 inches, 2.98 inches above the July normal. Very heavy rains fell in many of the central and southern counties on the 5th, 6th, and 7th, and in Wayne, Carter, Oregon, Shannon, Laclede, Pulaski, Camden, Morgan, Cedar, Moniteau, Cole, Osage, Gasconade, Dallas and Wright counties, great damage was done by floods. Whole fields of corn and grain were washed away or ruined and other crops and property damaged to the extent of thousands of dollars. Much damage was also done in some counties by high winds, especially to corn and orchards. Except in portions of the northern sections the month was very unfavorable for harvest and haying and much grain, hay and flax was lost owing to the continued wet weather. The conditions, generally, were very favorable to the corn crop, however, and it made rapid growth in all sections. Cotton was injured to some extent by the excessive rains and there was complaint in a few counties of early potatoes rotting or taking second growth. There was also some complaint of grapes rotting, but as a rule all growing crops, garden vegetables and fruit did exceedingly well.

The mean temperature for the month of August was about normal in the central and northwest sections, from 1 to 1.5 degrees above in the eastern sections and about one degree below the normal in the southwest section. The precipitation for the month was heaviest in the nothwest section, where, at a number of stations, it exceeded 8 inches, and throughout that section, the greater part of the northeast section, and a considerable portion of the southwest section it was decidedly in excess of the normal. From Pike, Randolph and Carroll counties northward (except over portions of Schuyler, Scotland and Clark counties) and along the western side of the State as far south as Vernon county the total precipitation for the month exceeded 4 inches; and over a large part of that area it exceeded 6 inches. A few stations in the central and southern sections also reported a total rain-

fall for the month of over 4 inches, but generally in those sections it ranged from 1.50 to 3.50 inches, and in the southeast section there was an average deficiency of .50 inch. In a few counties, principally in the central and southern sections, late corn suffered to some extent from drouth during the second and early part of the third decade, but as a rule the month was unusually favorable for that crop as well as for the growth and maturing of all other crops, and the rains of the last decade put fall pastures in good condition. Corn cutting was commenced in the extreme southern counties during the second decade. Haying was practically completed by the 10th, and plowing for wheat was general. In some counties plowing was delayed by drouth and in others by heavy rains. Frequent showers in a few of the southwestern counties hindered threshing and haying, and in Cass county, especially, much grass, flax and hay was lost.

The month of September was much warmer than usual, the mean temperature of the month for the State being 4 degrees above the normal. Remarkably high temperatures prevailed from the 9th to the 22d, and at many stations the maxima for the year were recorded during that period. The first marked cool wave of the season passed over the State on September 22, and caused a fall in temperature of from 20 to 40 degrees within a very few hours. Light frost occurred on the morning of the 23d, and in a few places killing frost was reported on low lands. The first general killing frost of the season occurred on September 30. The precipitation during September was deficient, generally, except in the northeast section where, at most stations, there was a slight excess. In the northwest section the average precipitation was only about 30 per cent of the normal amount, and in the central section it was less than 40 per cent. In the southeast section the deficiency was slight. Over a number of the extreme southwestern counties unusually heavy rains occurred during the first decade, but over the greater portion of that section the rain-fall for the month was much below the normal. A very severe hail storm passed over a portion of the northeast section on the 3d, doing considerable damage. Hailstones fell in Ralls county that measured three inches in diameter. The weather during the month was all that could be desired for maturing the corn crop, but plowing and seeding were delayed by the dryness of the soil, and apples were considered injured by the hot sun and high winds, many dropping off and rotting. Pastures also suffered considerably from drouth in many sections and at the close of the month stock water was becoming scarce.

The month of October was unusually cold throughout the State, there being an average daily deficiency in temperature of from 3.5 to

4.5 degrees in the central and northern sections, and 5.0 to 6.5 degrees in the southern section. The mean temperature for the State, 51.0 degrees, is 4.7 degrees below the normal. The following table shows the mean temperature for the State, for the month of October, since 1888:

1888	53 6	1892	57.5
1889	53 8	1893	56 7
1890	54 8	1894	57.6
1891	55.7	1895	51 0

Considered for the State at large, the month went on record as the dryest October that has been experienced in Missouri for many years. At Boonville, Brunswick, Glasgow, Mine La Motte, Mexico, St. Charles, Shelbina and St. Joseph, where the records cover periods of from 17 to 22 years, and also at St. Louis, where the record extends to 1839, the precipitation was the least yet recorded for the month of October, and at Miami it was the dryest October since 1859.

At a very few stations in the southwest section the precipitation exceeded 1 inch, but over the greater portion of the State it was less than .50 inch, and at several stations in the central and northern sections no measurable amount fell during the month. The average precipitation for the State was 0.35 inch—2.22 inches less than the October normal. The average precipitation for the State for October, during the past eight years, was as follows:

1888	2.65 inches	1892	2.28 inches
1889	2.50 "	1893	0.99 "
1890	2.24 "	1894	1.74 "
1891	1.11 "	1895	0 35 "

A trace of snow fell at a few stations in the central and western sections.

Although the month was especially favorable for gathering the immense corn crop, the drouth was very severe on wheat and grasses, and in some districts seeding could not be finished, the ground being to dry to work. At the close of the month stock water was reported scarce in nearly all sections.

The temperature during November averaged very near the normal in all sections, the mean for the State, 41.6 degrees, differing from the normal by only .1 of a degree. The following table shows the mean temperature for the State, for the month of November, since 1888:

1888	41.6	1892	40 1
1889	39 9	1893	40 9
1890	45.9	1894	41.0
1891	40 0	1895	41.6

Except over a portion of the northwest section, and at a few scattered stations in the central and southern sections, the precipitation for the month was in excess of the normal. In the southern sections there was an average excess of 1.20 inches, in the central section 1.25 inches and in the northeast section .95 inch. There was also a considerable excess over the southern counties of the northwest section, but over the northern portion of that section there was a deficiency.

Over the extreme southeastern portion of the State the total precipitation for the month exceeded 6 inches, and over a large part of the southeast section, a number of counties in the central and northeast sections and at a few stations in the southwest section, it exceeded 4 inches. Over the remainder of the State it ranged from 2 to 4 inches, except over that portion lying north of Platte, Clinton, Caldwell, Livingston, Sullivan and Adair counties, where it was less than 2 inches. The average precipitation for the State was 3.40 inches—.96 of an inch above the normal. The average precipitation for the State for November, during the past eight year, was as follows:

1888	3.26 inches	1892	2.52 inches
1889	3.43 "	1893	1.60 "
1890	2.33 "	1894	1.58 "
1891	3.60 "	1895	3.40 "

On the 24th a drizzling rain that froze as it fell occurred over a considerable portion of the State and all exposed objects were covered with a thick coating of ice.

Over the northeast, central and southwest sections, and the northern portion of the southeast and southern portion of the northwest sections, the snowfall for the month, the greater part of which fell during the storm of the 25-26th, was unusully heavy, many stations reporting from 4 to 6 inches, while at a number of stations in the east central counties the total for the month exceeded 6 inches. At most stations in the northwest section the snowfall for the month was less than 1 inch, and at Marble Hill, Poplar Bluff, Gayoso, New Madrid and Sikeston, and Cairo, Ill., in the southeast section, no snow fell during the month. There was practically no snow on the ground on the 15th, and the following are the only stations reporting more than a trace on the ground at the end of the month: Marceline, 1 inch; McCune Station, 2 inches; Warrenton, 4 inches; Hastain, 1.5 inches.

Except in some of the northwestern counties, the drouth, which began early in September, was relieved by good rains during the first decade of the month and the condition of the wheat crop was considerably improved. The crop as a rule was very backward, however,

and there was much complaint that it was thin on the ground. The lack of moisture during September and October prevented germination, and in some localities at the close of the month wheat sown nearly two months previous was only just above the ground. In many places seeding could not be completed until the middle of November. Stock water continued very scarce in many of the northern counties.

In the eastern sections of the State December averaged about one degree warmer than usual, but in the remaining sections the mean temperature differed less than a degree from the normal. The mean temperature of the State was 34.3 degrees, .4 of a degree above the normal. The following table shows the mean temperature of the State for the month of December since 1888:

1888	35.9	1892	29.4
1889	46.8	1893	35.2
1890	36.2	1894	36.7
1891	40.2	1895	34.3

Except at a very few stations in the extreme northwestern and southeastern counties, the precipitation for the month was far above the normal, and over a considerable portion of the State was the heaviest for the month of December of which there is any record. Over a large area in the central and southwest sections the total for the month exceeded 8 inches, and over nearly all of those sections, the greater part of the northeast section and a considerable portion of the southeast section, it exceeded 6 inches. Pickering, Maryville and Conception, Nodaway county, Akron, Harrison county, Oregon, Holt county, and St. Joseph, Buchanan county, were the only stations reporting less than 2 inches. The total precipitation for the month and its distribution over the State is shown by the chart on page 195. In the southwest, central and northeast portions of the State the greater part of the rainfall of the month fell during the storm which prevailed from the 17th to the 20th. At Phillipsburg, Laclede county, the total fall during this storm was 12.20 inches, 6.95 inches falling between 5 p. m. of the 17th and 5 p. m. of the 18th. At Lebanon, in the same county the total precipitation for the storm was 10.50 inches; at Springfield, Mt. Vernon, Lawrence county, and Fulton, Callaway county, it exceeded 9 inches and over the greater part of the central and southwest sections and a considerable portion of the northeast section, it exceeded 6 inches. The total precipitation during this storm and its distribution over the State is shown by the chart on page 195.

This phenomenally heavy rainfall caused floods in the Osage, Sack, Spring, Gasconade, Meramec and Cuivre rivers and their tributaries, and other streams in the southwest, central and east central portions of the State which did great damage to property and crops, and caused the loss of a number of lives. The Osage river is reported to have been the highest since 1844, and the floods were the worst ever known to have occurred at this season of the year. Bridges and culverts were washed out; many buildings were submerged, their contents destroyed and a large number of families rendered destitute; fences were carried away, thousands of bushels of corn that remained in shock were lost, and many head of cattle and hogs were drowned.

The average precipitation for the State, for the month, was 6.19 inches, 4.19 inches above the normal. The average precipitation for the State, for December, during the past eight years, was as follows:

1888	2 29 inches	1892	2.38 inches
1889	0.96 "	1893	0.95 "
1890	1.03 "	1894	2.13 "
1891	1.90 "	1895	6.19 "

The greatest local monthly precipitation was 13.67 inches at Phillipsburg, Laclede county.

The following heavy rainfalls have been recorded for the month of December in previous years:

Centreville, Reynolds county, 7.22 inches; Ironton, Iron county, 7.47 inches; Mine La Motte, Madison county, 6.13 inches; Carthage, Jasper county, 6.91 inches; Keesee's Ferry, Ark. (near Protem, Taney county), 11.37 inches; Peirce City, Lawrence county, 10.10 inches; Springfield, 7.62 inches, and Jefferson City 6.40 inches, in 1884; Gayoso, Pemiscot county, 7.50 inches in 1879; St. Louis, 10.90 inches in 1846, and 8.52 inches 1858; Atchison, Kan., 6.05 inches in 1873; Carrollton, Carroll county, 6.70 inches in 1879; Rolla, Phelps county, 5.70 inches in 1873, and Wet Glaze, Camden county, 9.30 inches in 1872, and 8.60 inches in 1873.

The snowfall during December was heavest in the northwest, west-central and southeastern counties where, at most stations, the total for the month ranged from 5 to 8 inches. Over the remainder of the State it was generally less than two inches, and at a number of stations only a trace fell during the month. The greatest amount recorded for the month was 14.6 inches at New Madrid. There was practically no snow on the ground on the 15th. At the close of the month the ground was covered to a depth of from 1 to 6 inches through-

out the greater part of the southeast section, and many stations in the northwest section reported a depth of from 1 to 4 inches. Elsewhere the ground was generally bare.

CHART SHOWING TOTAL PRECIPITATION FOR DECEMBER, 1895.

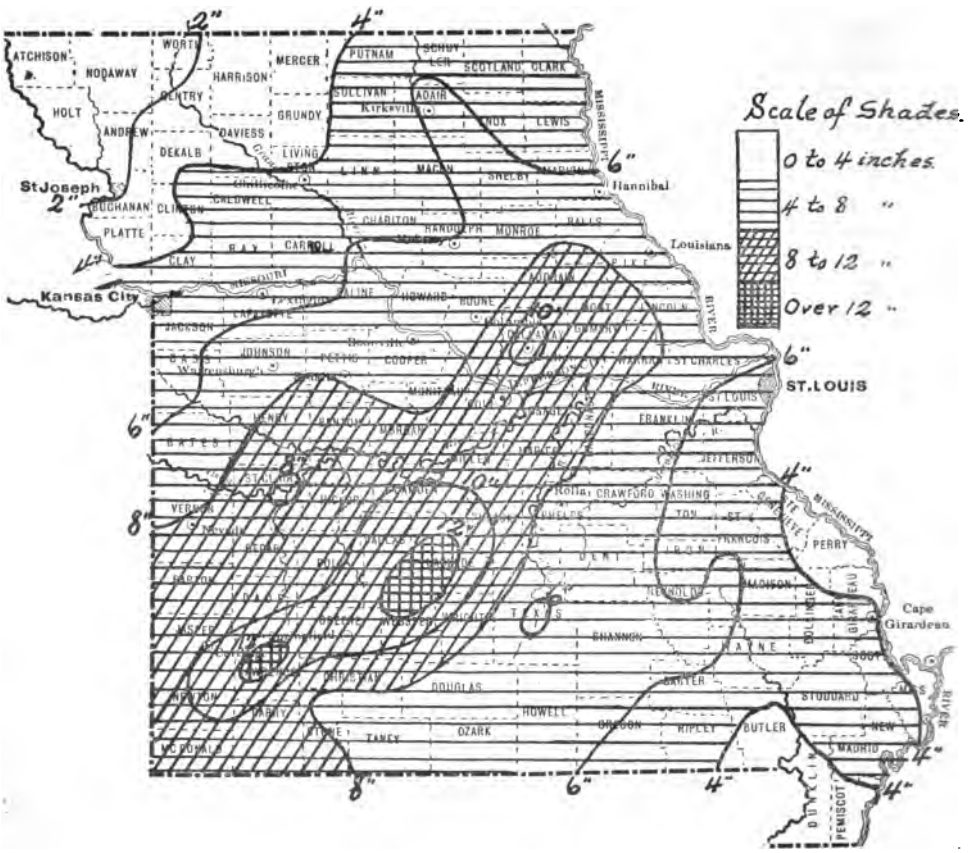
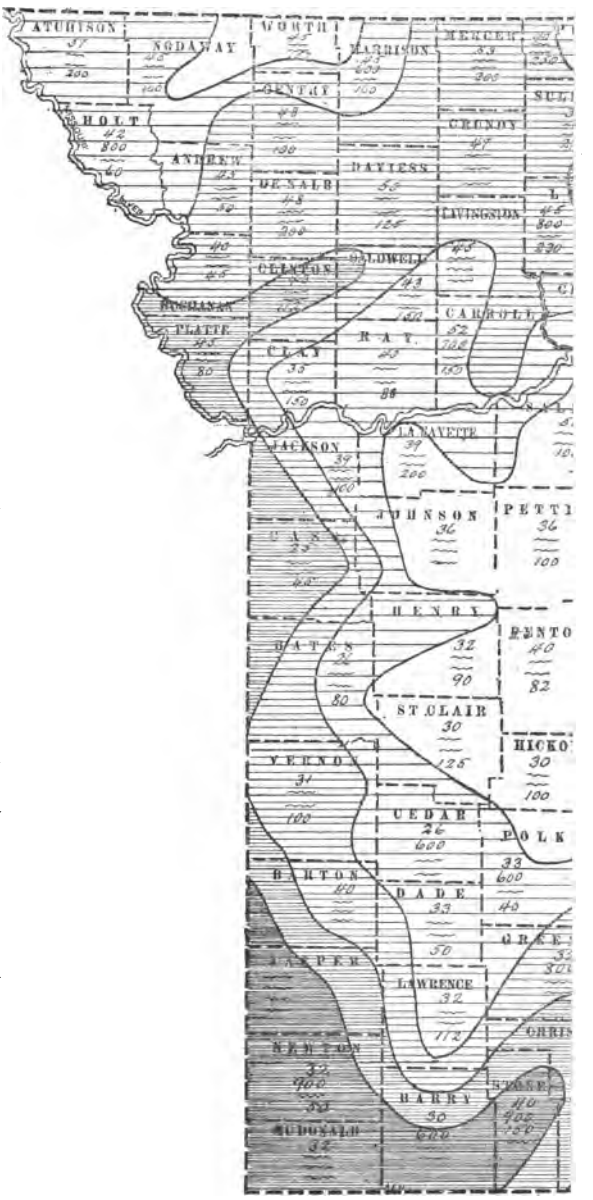


CHART SHOW

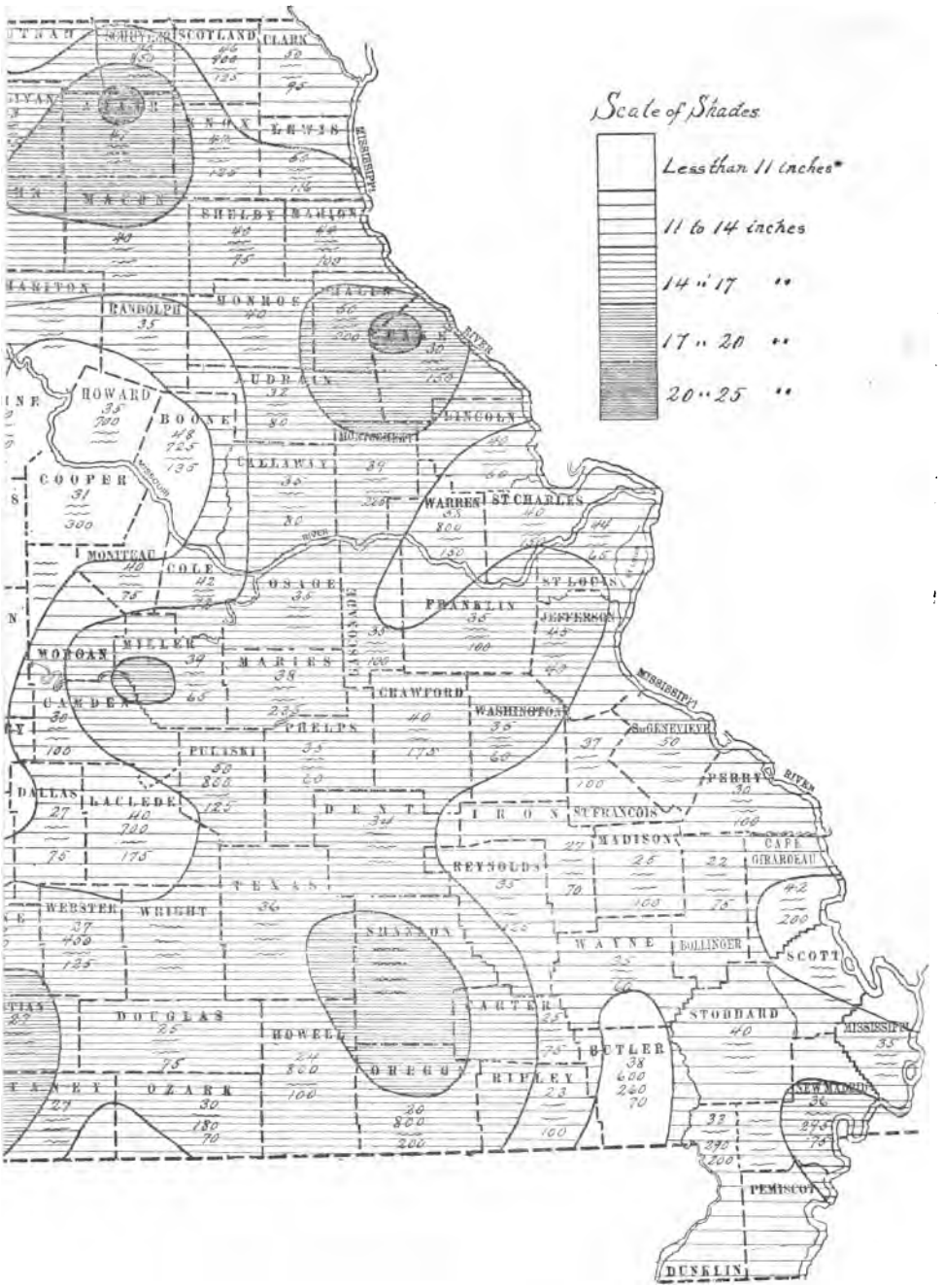
The distribution
The first figures
in bushels per acre,
acre.

CHART SHOWING THE TOTAL PRECIPI
AND OCTOBER, 1895, AND THE YIE



The distribution of precipitation is shown by the differ
The first figures in each county indicate the yield of co
the yield of cotton in pounds per acre after ginni ng, and th

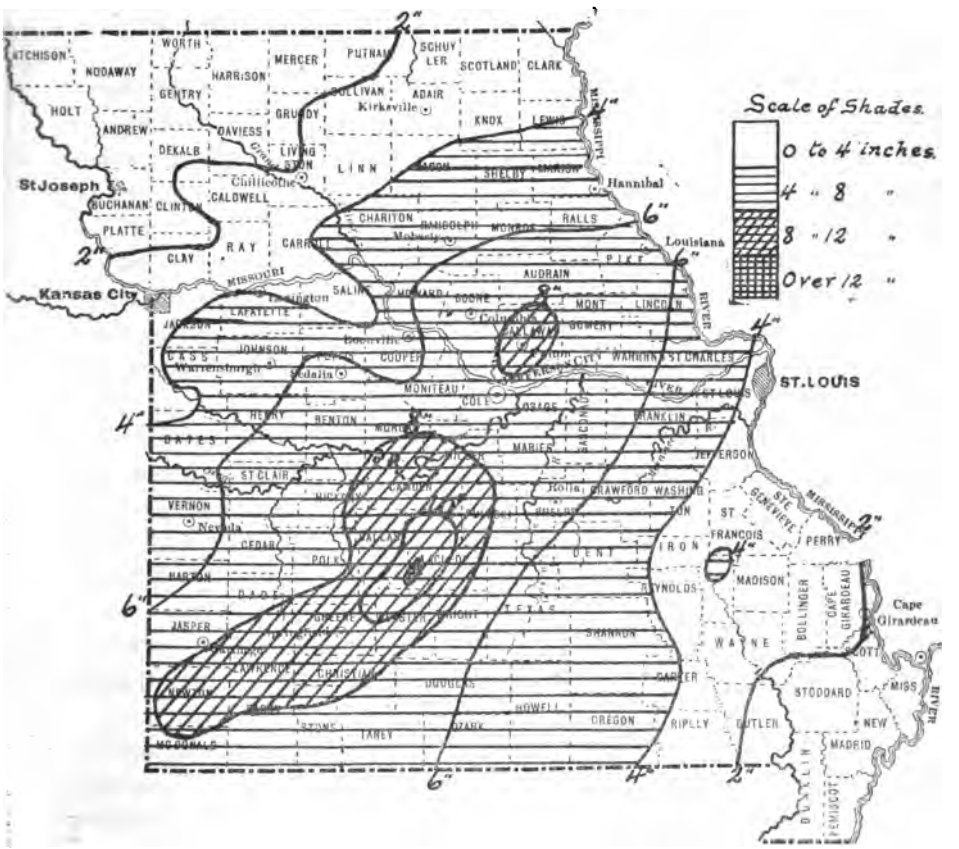
:TATION FOR THE FOUR MONTHS, JULY, AUGUST, SEPTEMBER LD OF CORN, TOBACCO, COTTON AND POTATOES, CROP OF 1895.



EXPLANATION.

ent degrees of shading. The amount indicated by each shade is given in the scale of shades.
:n in bushels per acre; the second figures the yield of tobacco in pounds per acre; the third figures
e fourth the yield of potatoes in bushels per acre.

CHART SHOWING TOTAL PRECIPITATION DURING THE STORM OF DECEMBER 17–20, 1895.



COUNTY A. & M. ASSOCIATIONS---1895.

In submitting a report of these societies, we regret our inability to give a more satisfactory account for 1895.

Many of these companies are badly in debt. Hard times and financial panics affect them as readily as the individual, and to such an extent that some have been closed out, others are unable to hold meetings and others do so only by paying the losses out of the pockets of the stockholders.

Most of the associations have good grounds, tracks and all necessary buildings, and with a restoration of confidence and a return to prosperous conditions would no doubt meet with such encouragement from the public as would justify them in opening their grounds and offering liberal awards.

In a State like this where we have such environments as fit it for the stock breeding nursery of the world—with herds of live-stock that might be exhibited with profit anywhere on the face of the globe, with the products of agriculture and horticulture unsurpassed—it is to be regretted that agricultural societies are not more prosperous and do not meet with more uniform success.

What may be done to better their condition might be carefully considered by those who would promote the great agricultural interests of the State.

We cannot do without these local meetings. They are schools in agriculture where the farmer and his sons take lessons in live-stock breeding, where he is taught the difference between the scrub and the thoroughbred, what breeding and what feeding will do for the animal world, where he is encouraged to step out of old ruts and occupy advanced and more profitable fields. The country fair is where our great breeders, yet in boyhood, receive their first lessons in stock breeding. The pride and exaltation with which he leads his first winning calf or colt from the show ring is an impressive lesson never forgotten. To breed something superior of its kind, to breed a winner

in the best company, to surpass his neighbor is his ambition and commands his best thought and assidious attention. Success encourages him in his work, and reverses in the show ring stimulate him to greater exertions. To an ardent and active interest thus developed to this enthusiasm, this fervor to the never-dying flame of this zeal we are indebted for our magnificient herds of thoroughbred horses, cattle, sheep and hogs. Without this determination to excel, which has been promoted more largely by local competition than by any other one factor, improvement while possible would have been slow and uncertain.

Nor does the county fair spend all its force on the breeder. After a look at the kings and queens of the show ring every farmer goes home feeling better towards himself and his calling and with a firm determination to improve his herds. Even the good wife is planning for the introduction of better poultry and is carefully estimating the profits of improved breeds. While we take it that but few will question the value of these exhibitions of live-stock and the products of the farm, nor dispute their tendency to promote the interest of improved breeds and advanced agriculture the question remains unsolved as to how we can make them profitable or remunerative.

In some states appropriations are made from the state treasury for their assistance. If this State aid was always expended judiciously and economically it would certainly merit consideration. But, if, as is the case in many instances where the plan is being tried, the management of the association becomes reckless and extravagant in proportion to the amount of State aid given, then the money would have been expended without advantage, the local support would have been retired and the interests demoralized.

Dismissing the thought of State aid we might ask if it was possible to improve the management of these associations. It is frequently the case; and one that no doubt contributes largely toward failure, that the public spirited business men who organize these stock companies and subscribe liberally to their capital stock have no time to supervise or aid in their management. This is given over to those who can take it, without regard to their fitness from an executive or a business standpoint. When the fair is over and a final "round up" is made and the claims are adjusted it is found that incidental expenses, some of which were extravagant, some unnecessary and other almost fraudulent, have practically consumed the receipts, and the stockholders are called upon to raise money to pay the awards.

Some action that was intended to temporarily increase the revenues, or some retrenchment in an effort to make "both ends meet," may have

proved a blunder, and unsatisfactory to the exhibitor and to the attendance. One mistake follows another until the people become dissatisfied, the stockholders disgusted, and the association suspends. In the course of a few years another company is organized, encounters similar experience, is carried at a loss to the stockholders, and finally dissolved.

Cannot these conditions be changed? Cannot such rules and regulations be adopted as will conserve the funds and permit only prudent and judicious expenditures? Cannot strictly business principles be applied to the management of county fairs and such policy pursued as will win for them the highest esteem of the public and the confidence of the exhibitors? If encouraged and supported by an appreciative public, if the management is such as to command their approval and endorsement, then the prosperity and success of the county fair awaits only the ability of the public to contribute to its support, which, under normal conditions, should seldom fail in Missouri.

ATCHISON COUNTY.

Rockport A. & M. Society.

Number of members	76	
Indebtedness	$1,906	
ASSETS.		
Land, number of acres, 55. Value		$5,500 00
Buildings—		
Floral hall		1,000 00
Amphitheater		750 00
Stalls and pens		2,100 00
Other improvements		600 00
Due on stock		412 00
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		28
Best time, aged horses		2 : 28
Pacers—Total entered, all ages		8
Best time, aged horses		2 : 16¼
Runners—Total entered, all ages		9
Best time, 1 mile		1 : 51
Best time, ¾ mile		1 : 22
Best time, ½ mile		54
Live-stock—		
Horses—All kinds		54
Cattle		17
Hogs—All breeds		62
Poultry—Large breeds		58
Farm and garden products, number of entries		357
Implements		9
Ladies' department		369
Miscellaneous		11
Total number of entries		978
Total amount of premiums paid	$1,765 90	
Expenses other than for premiums	1,110 81	
Total receipts	2,908 85	
Balance on hand	32 14	

REMARKS—Two days' rain caused heavy track and slow time. Atchison county made an appropriation of $100, which was divided among several classes as sweepstake purses.

MILES SICKLER, President.

BATES COUNTY.

Rich Hill Fair Association.

Number of members	143	
Indebtedness	$500	
ASSETS.		
Land, number of acres, 40. Value		$2 000
Buildings—		
Grand-stand		800
Stalls		1,500
Main hall		400
Other improvements		100
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		36
Best time, aged horses		2 : 24
Pacers—Total entered, all ages		43
Best time, aged horses		2 : 18
Best time, 1 year old, ½ mile		1 : 17
Runners—Total entered, all ages		24
Best time, ⅛ mile		1 :
Live-stock—		
Draft horses, number		10
All purpose horses		14
Coach horses		9
Roadster horses		25
Saddle horses		24
Hogs, all breeds		41
Sheep, mutton breeds		6
Poultry, large breeds		28
Poultry, egg producers		40
Farm and garden products, number of entries		355
Ladies' department		341
Miscellaneous		103
Total number of entries		1,035
Total number premiums paid		403
Total amount of premiums paid	$3.482 15	
Expenses other than for premiums	2,758 14	
Total receipts	6,396 70	

S. D. BROADDUS, Secretary. A. E. BEATY, President.

BUCHANAN COUNTY.

St. Joseph Fair Association.

Number of members	234	
ASSETS.		
Land, number of acres, 80. Value, leased.		
Buildings—		
Main hall		$7,466 23
Grand stand		6,182 02
Stables		8,429 60
Cattle, hog and horse sheds		5,000 00
Cattle fence		1,800 00
Offices and stands		981 00
Real estate		4,162 69
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		123
Best time, aged horse		2 : 08½
Best time, 2 years old		2 : 20
Pacers—Total entered, all ages		96
Best time, aged horses		2 : 10¼
Best time, 2 year olds		2 : 20¼
Live-stock—		
Draft horse, number		18
Coach horses		4
Roadster horses		15
Saddle horses		19
Cattle, beef breeds		49
Cattle, dairy breeds		21
Hogs, all breeds		19
Poultry, large breeds		128
Poultry, egg producers		80
Farm and garden products, number of entries		475
Implements		360
Ladies' department		357
Miscellaneous		304
Total number of entries		1,813
Total number of premiums paid other than for speed ring		399
Total amount of premiums paid	$2,100	
Expenses other than for premiums	8,000	
Total receipts	21,000	

REMARKS—The financial results of this year were not satisfactory, and no final statement for this year has been made.

JOHN COMBE, Secretary. JAS. N. BURNES, JR., President.

BUTLER COUNTY

Fair Association.

Number of members	78	
Indebtedness	$223 73	
ASSETS.		
Buildings—		
Amphitheater, value		$200
78 stables		390
Judges' stand		10
Band stand		15
Secretary's office		20
Other improvements, 23 new stables.		
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		18
Best time, aged horses		2 : 24½
Pacers—Total entered, all ages		11
Best time, aged horses		2 : 32 3-5
Runners—Total entered, all ages		35
Best time, 1 mile		1 : 48
Best time, ½ mile		51¼
Live-stock—		
Horses—Draft, number		13
Coach		14
Roadster		7
Saddle		3
Cattle—Beef breeds		6
Dairy breeds		5
Hogs—All breeds		4
Farm and garden products, number of entries		47
Implements		3
Ladies' department		248
Miscellaneous		93
Total number of entries		443
Total number of premiums paid		216
Total amount premiums paid	$848 97	
Expenses other than premiums	943 34	
Total receipts	1,452 65	

REMARKS—The report submitted is showing somewhat poor. The poultry raising here is good, but because of the non-capacity of buildings there was none exhibited; same with hogs. I think, however, in the future we will have better exhibits in all stocks, etc.

A. MAST, Secretary. E. R. SENTZ, President.

CAPE GIRARDEAU COUNTY.

Southeastern District Agricultural Society.

Number of members	296	
Indebtedness, in stock	14,034 00	
Exhibits.		
Speed rings—		
Trotters—Total entered, all ages		6
Best time, aged horses		2 : 43½
Pacers—Total entered, all ages		10
Best time, aged horses		2 : 18
Runners—Total entered, all ages		24
Best time, 1 mile		1 : 46
Best time, ½ mile		: 51
Live-stock—		
Draft horses, number		12
Coach horses		3
Roadster horses		11
Saddle horses		17
Horses for all work		47
Cattle, beef breeds		10
Cattle, dairy breeds		13
Hogs, all breeds		40
Sheep, all breeds		14
Poultry, all breeds		47
Farm and garden products		302
Implements		6
Ladies' department		390
Miscellaneous		48
Total number of entries		1,000
Total amount of premiums paid	$2,074 75	
Expenses other than for premiums	1,400 00	
Total receipts	3,125 00	

E. H. Engleman, Secretary. Geo. G. Kimmel, President.

CARROLL COUNTY

Fair Association.

Number of members		12
Indebtedness, none.		
ASSETS.		
Land, number of acres, 40. Value		$2,000
Buildings		8,000
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		22
Best time, aged horses, (16)		2:23¾
Best time, 2-year olds, (3)		2:42
Best time, 1 year olds, one-half mile, (3)		1:46½
Pacers—Total entered, all ages		20
Best time, aged horses, (20)		2:19¾
Runners—Total entered, all ages, number		35
Best time, 1 mile, (7)		1:50½
Best time, ½ mile, (14)		51½
Live-stock—		
Draft horses, number		14
Roadster horses		13
Saddle horses		6
Poultry, all breeds, large numbers.		
Farm and garden products		35
Total amount of premiums paid	$ 2,300 00	
Expenses other than for premiums	574 65	
Total receipts	2,749 65	

The expense account includes repairs, improvements, insurance, in addition to the actual running expenses of the meeting.

W. J. TURPIN, Secretary. F. J. WHITE, President.

CASS COUNTY.

Belton Fair Association.

Number of members	48	
Indebtedness	$1,800	
ASSETS.		
Land, number of acres 40. Value		$5,000
Buildings—		
Grand-stand		3,000
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		32
Best time, aged horse		2 : 39¼
Pacers — Total entered, all ages		8
Best time, aged horse		2 : 19¼
Runners—Total entered, all ages		24
Best time, one-half mile		: 54
Live-stock—		
Horses—Draft, number		7
Coach		50
Roadster		14
Saddle		17
Hogs — All breeds		25
Sheep— Mutton breeds		10
Wool breeds		2
Poultry—Large breeds		24
Egg producers		6
Farm and garden products		170
Implements		8
Ladies' department		162
Miscellaneous		15
Total number of entries		584
Expenses other than for premiums	$229 75	

F. G. ROBINSON, Secretary. JOHN BALES, President.

CLARK COUNTY

Agricultural and Mechanical Association.

Number of members	135	
Indebtedness	$600	
ASSETS.		
Land, number of acres 30. Value		$3,000
Buildings—		
Art Hall		1,500
Stables		1,000
Amphitheater		1,500
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total number entered, all ages		35
Best time, aged hors s		2 : 23
Best time, 3 year olds		3 : 00
Best time, 2 year olds		3 : 20½
Pacers—Total entered, all ages		13
Best time, aged horses		2 : 22
Best time, 3 year olds		2 : 45
Runners—Total entered, all ages		11
Best time, ⅝ mile		1 : 07
Best time, ¾ mile		1 : 21
Best time, ½ mile		: 52
Live-stock—		
Horses—Draft, number		31
Coach		17
Roadster		37
Saddle		18
Cattle—Beef breeds		43
Dairy breeds		24
Hogs—All breeds		75
Sheep—Mutton breeds		33
Wool breeds		27
Farm and garden products		370
Implements		15
Ladies' department		731
Miscellaneous		200
Total number of entries		1,440
Total number of premiums paid		700
Total amount of premiums paid	$2,200	
Expenses other than for premiums	800	
Total receipts	3,800	

REMARKS—We had a good fair, better than for several years.

JOSEPH VANDOLAH, Secretary. W. M. BOULWARE, President.

CLINTON COUNTY.

Cameron Agricultural & Mechanical Association.

Number of members	7
Indebtedness, none.	
ASSETS.	
Land, number of acres, 40 Value	$10,000
General condition of property, good.	
EXHIBITS.	
Speed rings—	
Trotters—Total entered, all ages	72
Best time	2:18
Best time, 3 year olds	2:18
Best time, 2 year olds	2:25½
Pacers—Total entered, all ages	70
Best time, aged horse	2:18½
Best time, 2 year olds	2:41
Runners—Total entered all ages	20
Best time, ½ mile	51¼
Live-stock—	
Horses—Draft, number	25
Roadster	25
Saddle	10
Cattle—Beef breeds	20
Dairy breeds	50
Hogs—All breeds	100
Sheep—All breeds	50
Poultry—All breeds	30

REMARKS—Our Association did not hold a fair this year, only a race meeting, but there was a fair held by the farmers of this county on our grounds with W. B. Porter as secretary, and H. S. Beesy as president.

R. DESTEIGUER, Secretary.

DADE COUNTY

Agricultural and Mechanical Association.

Number of members (stock holders)	163	
Indebtedness	$400	
ASSETS.		
Land, number of acres 20. Value		$2,000
Buildings—		
Floral hall		400
Office		100
Barns		750
Pens		100
Amphitheater		1,200
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		9
Best time, aged horses		2 : 31
Best time, 3 year olds		2 : 10
Pacers—Total entered, all ages		17
Best time, aged horses		2 : 38
Best time, 3 year olds		3 : 10
Runners—Total entered, all ages		15
Best time, ½ mile		55
Live-stock—		
Draft horses, number		21
Coach horses		42
Roadster horses		20
Saddle horses		13
Cattle, beef breeds		10
Cattle, dairy breeds		2
Hogs, all breeds		21
Sheep, mutton breeds		12
Poultry, large breeds, coops		22
Farm and garden products		225
Implements		15
Ladies' department		300
Miscellaneous		50
Total amount premiums paid	$975 00	
Expenses other than for premiums	600 00	
Total receipts	1,062 66	

REMARKS—Our association is in a prosperous condition, but on account of bad weather we were obliged to pay our premiums at 65 cents on the dollar in order to keep out of debt.

A J. YOUNG, Secretary.

GASCONADE COUNTY

Agricultural Association.

Number of members	81	
ASSETS.		
Land, number of acres, 6 11-100. Value		$2,500
Buildings—		
Rotunda		500
Poultry house		150
Exposition halls		500
Stables		100
Music stand and other buildings		200
Other improvements		200
Other property		50
General condition of property, good.		
EXHIBITS.		
Live-stock—		
Horses—All kinds, number		14
Cattle—Dairy breeds		6
Hogs—All breeds		3
Poultry—All kinds		48
Fruits		159
Wines		43
Farm and garden products		126
Farm implements		23
Ladies' department		110
Miscellaneous		75
Total number of entries		607
Total number of premiums paid		172
Total amount of premiums paid	$374 50	
Expenses other than for premiums	345 34	
Total receipts	803 30	
Cash on hand	562 37	

WM. C. BOHING, Secretary, HUGO KROPF, President.

GENTRY COUNTY

Fair Association.

Number of members	32	
Indebtedness (none).		
ASSETS.		
Land, number of acres, 45. Value		$4,500
Buildings—		
Floral hall		2,000
Judges' stand		250
150 stalls		3,000
Fence		850
One-half mile race track, 60 feet wide, 660 feet stretches, fenced and graded one inch to the foot at ends, and 15 feet in total width at stretches. Cost		1,200
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		3
Runners—Total entered, all ages		40
Live-stock—		
Draft horses, number		13
All purpose horses		20
Thoroughbreds		12
Standard		6
Cattle, beef breeds		8
Cattle, dairy breeds		8
Hogs, all breeds		23
Poultry, large breeds		12
Farm and garden products and implements, number		46
Ladies' department		322
Miscellaneous		54
Total number of entries		568
Total number of premiums paid		254
Amount of premiums paid, balloon, etc	$1,586 39	
Expenses other than for premiums	600 00	
Total receipts	2,186 39	
Balance in treasury after all debts are paid	189 50	

S. W. CLARK, Secretary. G. G. STROCK, President.

GREENE COUNTY.

Springfield & Southwestern Association.

Number of members	8	
Indebtedness	$7,000	
ASSETS.		
Buildings—		
Grand-stand. Value		$2,000 00
Exposition building		2,000 00
Floral hall,		1,500 00
Secretary's office, judges' stand and pool stand		500 00
Stables		1,500 00
General condition of property, good at present.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		31
Best time, aged horses		2 : 23
Best time, 3 year olds		2 : 27¼
Pacers—Total entered, all ages		27
Best time, aged horses		2 : 22½
Best time, 3 year olds		2 : 25½
Runners—Total entered, all ages		31
Best time, 1 mile		1 : 46
Best time, ⅝ mile		1 : 04
Best time, ½ mile		: 52½
Live-stock—		
Horses—Draft, number		14
Roadsters		62
Saddle		25
Cattle—Beef breeds		44
Dairy breeds		24
Hogs—All breeds		100
Sheep—Mutton breeds		42
Wool breeds		11
Poultry—Large breeds		91
Egg producers		21
Farm and garden products, number of entries		11
Implements		11
Ladies' department		647
Total number of entries		3,292
Total number of premiums paid		250
Total amount of premiums paid	$4,857 42	
Expenses other than for premiums	2,291 38	
Total receipts	6,948 80	

REMARKS—Hard times, and rained four days.

H. F. DENTON, Secretary.

C. B. MCAFEE, President.

GRUNDY COUNTY

Fair Association.

ASSETS.		
Land, number of acres, 23. Value		$9,000
Buildings—		
Floral hall		400
Judges' stand		50
65 horse stalls		1,000
50 cattle stalls		400
40 sheep and hog pens		300
Amphitheater		500
General condition of property, fair.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		18
Best time, aged horses		2 : 22
Pacers—Total entered, all ages		11
Best time, aged horses		2 : 33
Runners—Total entered, all ages		32
Best time, 1 mile		1 : 48
Best time, ¾ mile		1 : 19
Best time, ½ mile		: 50
Live-stock—		
Draft horses, number entered		69
Coach horses		58
Roadster horses		22
Saddle horses		2
Cattle, beef breeds		33
Hogs, all breeds		43
Sheep, mutton breeds		30
Poultry, large breeds		76
Farm and garden products, number entries		93
Farm implements		23
Miscellaneous		87
Total number of entries		597
Total amount of premiums paid	$2,000 00	
Expenses other than for premiums	657 11	

PETER YAKEY, Secretary. G. W. SMITH, President.

HARRISON COUNTY.

Ridgeway Fair Association.

Number of members	5	
Indebtedness	$1,000	
ASSETS.		
Land, number of acres, 40. Value		$1,200
Buildings—		
Art hall		300
Dining hall		100
Amphitheater		100
Judges' stand		50
Stalls and pens		50
General condition of property, fair.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		12
Best time, aged horses		2 : 52
Pacers—Total entered, all ages		5
Best time, aged horses		2 : 50
Runners—Total entered, all ages		11
Best time, 1 mile		1 : 46
Best time, ½ mile		51½
Live stock—		
Draft horses, number		26
Coach horses		11
Roadster horses		9
Saddle horses		2
Cattle—Beef breeds		20
Hogs—All breeds		40
Sheep—Mutton breeds		15
Poultry—Large breeds		30
Egg producers		25
Farm and garden products		36
Ladies' department		86
Total number of entries		244
Total amount of premiums paid	$250	
Expenses other than for premiums	425	
Total receipts	692	

C. M. JAQUA, Secretary. H. J. HERRING, President.

JOHNSON COUNTY

Agriculture and Mechanical Fair Association.

Indebtedness	$1,700	
ASSETS.		
Land, number of acres 40. Value		$3,500
Buildings—		
Art hall		700
Secretary's office		100
Stalls		2,000
Amphitheater		1,000
Hog and sheep pens		200
Other improvements, track		800
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		29
Best time, aged horses		2 : 26¼
Pacers—Total entered, all ages		27
Best time, aged horses		2 : 22¼
Best time, 2 year old		2 : 28
Runners—Total entered, all ages		18
Best time, ½ mile		51
Live-stock—		
Horses—Draft, number		9
Coach		35
Roadsters		39
Saddle		29
Hogs—All breeds		98
Sheep—Wool breeds		11
Poultry—Large breeds		37
Farm and garden products, number of entries		170
Ladies' department		160
Total amount of premiums paid	$2,643 10	
Expenses other than for premiums	1,216 87	
Total receipts	4,438 55	

J. V. MURRAY, Secretary. WM. STEELE, President.

MACON COUNTY.

LaPlata Fair Association.

Number of members	50
Indebtedness	$100
ASSETS.	
Land, number of acres, 37½, rented.	
Buildings	$100
Stables	100
Buildings other than above	150
General condition of property, good.	
EXHIBITS.	
Speed rings—	
Trotters—Total number entered	30
Best time, aged horse	2:22¾
Pacers—Total entered, all ages	10
Best time, aged horses	2:22¾
Runners—Total entered, all ages	20
Best time, 1 mile	1:51
Best time, ½ mile	:52
Live-stock—	
Draft horses, all breeds, number	10
Roadster horses	40
Saddle horses	4
Cattle—Beef breeds	7
Dairy breeds	5
Hogs, all breeds	20
Poultry—Large breeds	6
Egg producers	8
Farm and garden products, number entries	100
Ladies' department	300
Miscellaneous	40
Total amount of premiums paid	$1,318
Expenses other than for premiums	500
Total receipts	2,018

REMARKS—The indebtedness was incurred in the year of 1894 of $300. We paid $200 this year.

A. S. RAY,
President.

H. L. LIBBEY, Secretary.

NODAWAY COUNTY.

Maryville Fair Association.

Number of members	14	
Indebtedness	$2,000	
ASSETS.		
Land, number of acres, 24 1-5. Value		$3,000
General condition of property, fair.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		47
Best time, aged horses		2 : 25¼
Best time, 3 years old		2 : 39½
Pacers—Total entered, all ages		13
Best time, aged horses		2 : 22¼
Runners—Total entered, all ages		104
Best time, ¾ mile		1 : 18½
Best time, ½ mile		: 50¾
Best time, ⅝ mile dash		1 : 05
Expenses and premiums	$2,550 20	
Total receipts	2,233 50	

C. H. BAINUM, Secretary. F. G. SHOEMAKER, President.

HOLT COUNTY.

Nodaway Valley District Fair Association.

Number of members	12	
Indebtedness	$800	
ASSETS.		
Land, number of acres, 40. Value		$4,000
Buildings—		
Floral hall		800
Barns, offices, etc		1,000
Other property		200
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total number entered, all ages		13
Best time, aged horses		2 : 19¼
Pacers—Total number entered, all ages		9
Best time, aged horses		2 : 22
Live-stock—Horses, draft, number		23
Coach		4
Roadster		10
Saddle		6
Cattle—Beef breeds		15
Hogs—All breeds		30
Farm and garden products, number		200
Ladies' department		250
Total amount of premiums paid	$1,800	
Expenses other than for premiums	1,000	
Total receipts	2,870	

E. H. HART, Secretary. D. A. GELVIN, President.

PLATTE COUNTY

Agricultural and Mechanical Association.

Number of members	70	
Indebtedness	$700	
ASSETS.		
Land, number of acres, 33. Value		$3,500
Buildings—		
Grand-stand		2,500
Floral hall		1,000
Other property		3,000
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Runners—Total entered, all ages		63
Best time, 1 mile		1 : 49
Best time, ¾ mile		1 : 18
Best time, ½ mile		: 50½
Live-stock—		
Horses—Draft, number entered		9
Thoroughbreds		27
Roadsters		40
Saddle		45
Cattle—Dairy breeds		20
Poultry—all breeds		44
Farm and garden products		127
Ladies' departments		268
Miscellaneous		298
Total number of entries		928
Total number premiums paid		445
Total amount of premiums paid	$2,092 50	
Expenses other than for premiums	1,553 53	
Total receipts	3,754 95	

REMARKS—The above indebtedness was incurred by the purchase of additions of real estate, and Association note given for same. Part of the amount of said note has been paid off, leaving a balance of $700, as above stated, and interest has been paid up to September of this year. We have a small balance in the treasury and some money due us, which, if collected, will go toward liquidating this debt.

WM. FORMAN, Secretary. W. A. ELGIN, President.

RANDOLPH COUNTY

Fair Association.

Number of members	93	
Indebtedness, none.		
ASSETS.		
Land, number of acres, 5. Value		$500
Buildings—		
Amphitheater		250
Floral hall		100
Other improvements		150
General condition of property, part getting old and needing repairs, balance in good shape.		
EXHIBITS.		
Live-stock—		
Draft horses, number		24
Harness and all purpose horses		56
Buggy horses		23
Saddle horses		24
Mules, jacks, and jennets		34
Cattle, beef breeds		32
Cattle, dairy breeds		43
Hogs, all breeds		30
Sheep, all breeds		24
Poultry, all breeds		20
Farm and garden products		72
Ladies' department		148
Miscellaneous		22
Total number entries		532
Total number premiums paid		272
Total amount of premiums paid	$403 00	
Expenses other than for premiums	373 95	
Total receipts	822 16	

W. S. COULTER, Secretary. AUSTIN CRISMAN, President.

ST. CHARLES COUNTY

Driving Park and Fair Association.

Indebtedness	$5,200	
ASSETS.		
Land, number acres, 41. Value		$9,399 00
Buildings—		
Grand stand		1,000 00
Art hall		1,500 00
Stables		1,500 00
Other improvements		1,662 35
General condition of property, first class.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		37
Best time, aged horses		2 : 32½
Best time, 3 year olds		3 : 03¾
Best time, 2 year olds		3 : 17
Pacers—Total entered, all ages		3
Best time, aged horses		2 : 54½
Runners—Total entered, all ages		5
Best time, ½ mile		52½
Live-stock—		
Draft horses, number		11
Coach horses		10
Roadster horses		22
Saddle horses		4
Cattle—Beef breeds		8
Dairy Breeds		17
Hogs—All breeds		25
Sheep—Mutton breeds		12
Wool breeds		12
Poultry—All breeds		73
Farm and garden products		213
Farm implements		45
Ladies' department		332
Total number of entries		784
Total number of premiums paid		332
Total amount of premiums paid	$1,338 50	
Total receipts	2,070 60	

ALBERT RUNGE, Secretary. P. T. MALLINCKRODT, President.

ST. FRANCOIS COUNTY

Agricultural and Mechanical Association.

Indebtedness	$1,200	
ASSETS.		
Land, number of acres 20. Value		$2,000
Buildings—		
Grand stand		100
Art hall		400
General condition of property, not in good condition.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages, number		3
Pacers—Total entered, all ages		5
Runners—Total entered, all ages		6
Live-stock—		
Horses—Draft, number		2
Roadster		5
Saddle		3
Farm and garden products, number of entries		27
Ladies' department		67
Total amount premiums paid	$163 30	
Expenses other than for premiums	411 16	
Total receipts	552 23	

J. C. ALEXANDER, Secretary. JAMES HIGHLEY, President.

ST. LOUIS COUNTY

Agricultural and Mechanical Society.

Number of members	238	
Indebtedness	$7,500	
ASSETS.		
Land, number of acres, 40. Value		$12,000
Buildings—		
Grand stand		500
Art hall		300
Exposition		600
Stables		500
Other improvements		2,000
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		15
Best time, aged horses		2 : 50
Best time, 2 year olds, ½ mile		2 : 08
Pacers—Total entered, all ages		10
Best time, aged horses		2 : 52½
Runners—Total entered all ages		10
Live-stock—		
Draft horses, number		16
Coach horses		2
Roadster horses		21
Saddle horses		8
Cattle, dairy breeds		12
Hogs, all breeds		34
Sheep, mutton breeds		10
Sheep, wool breeds		15
Poultry, large breeds		25
Poultry, egg producers		18
Farm and garden products		318
Ladies' department		189
Farm implements		125
Miscellaneous		118
Total number of entries		912
Total number premiums paid		353
Total amount of prmiums paid	$1,175 56	
Expenses other than for premiums	200 00	
Total receipts	1,560 00	

J. W. SCHABERG, Secretary. T. D. RAUCHENSTEIN, President.

SCHUYLER COUNTY

Fair Association.

Number of members	62	
Indebtedness	$3,200	
ASSETS.		
Land, number of acres, 48. Value		$2,880 00
Buildings—		
Grand stand		1,000 00
Art hall		600 00
Stables		1,000 00
Other property		200 00
Track		1,500 00
General condition of property, good.		
EXHIBITS.		
Speed rings—		
Trotters—Total entered, all ages		13
Best time, aged horses		3 : 41
Runners—Total entered, all ages		: 47
Best time, ½ mile		: 54
Live-stock—		
Horses—Draft, number		1
Coach		2
Roadster		2
Saddle		2
Cattle—Beef breeds		9
Dairy breeds		14
Hogs—All breeds		19
Sheep—Mutton breeds		12
Wool breeds		12
Poultry—Large breeds		25
Egg producers		15
Farm and garden products		103
Farm implements		3
Ladies' department		50
Miscellaneous		83
Total number of entries		352
Total amount of premiums paid	$217 65	
Expenses other than premiums	174 18	
Total receipts	641 73	

N. T. ROBERTS, Secretary.

SCOTLAND COUNTY

Fair Association.

Number of members	50	
Indebtedness	$1,400	
ASSETS.		
Land, number of acres, 40. Value		$1,600
Amphitheater		500
Barns and stalls		800
Cattle, sheep and hog pens		200
Art hall		250
Dining hall		250
General condition of property, fair.		
EXHIBITS.		
The omission of the speed rings at last fair caused not only a primary loss, but a loss of reputation as a fair people as well. We intend to try to regain our former status in this respect. With our people it is a fair or no fair.		
Live-stock—		
Draft horses, number		14
Roadster horses		40
Cattle, beef breeds		19
Cattle, dairy breeds		17
Hogs, all breeds		38
Sheep, mutton breeds		11
Poultry, large breeds		41
Poultry, egg producers		59
Farm and garden products		214
Ladies' department		485
Total number premiums paid		320
Total amount premiums paid	$635 50	
Expenses other than for premiums	500 00	
Total receipts	895 00	

You can see at a glance the hole we are in. This, however, has been remedied by an assessment, and we are solid for the next year. We will inject more "hoss" in our next program.

N. M. PETTINGILL,
Secretary.

AMONG MISSOURI HERDS.

The success of our live-stock exhibit at the World's Fair in Chicago in 1893 was a surprise to the world as well as to Missourians, and indicated a wealth of royal breeding and individual excellence among our stock that was unknown and unappreciated.

It was convincing evidence that Missouri live-stock could successfully compete with the best herds in the world and that her breeders were among the most advanced and progressive.

Having achieved such phenomenal success while our herds and the breeding industry were in their infancy, assures us of the brilliant future that awaits our continued and intelligently directed efforts. Not until Missouri stock shall have reached the acme of scientific breeding, until its excellence is known and fully appreciated and it is able to commmand the highest price paid for improved stock, should our breeders be content or satisfied with their achievements.

With the best foundation stock, with climatic and other conditions favorable, with an abundance of every variety of food and nutritious pastures and all environments as though we had them "made to order," there is no reason why we should occupy a second place amongst the breeders of the world, nor should not continue to lead in improved stock while others follow.

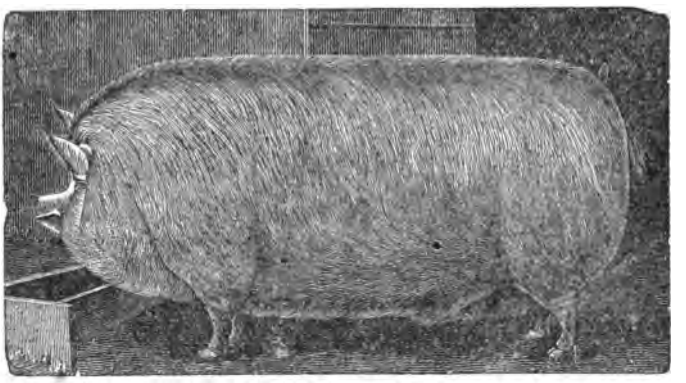
To note the achievements of our herds in 1895 when exhibited in competition with stock from other States we publish herewith a list of prize winners so far as we were able to obtain them by giving notice through the agricultural and live-stock papers and by correspondence with exhibitors.

It should be remembered that the conditions of 1895 were not such as would encourage our breeders to make large exhibits of stock in other States and away from home.

It was the afternoon of a great financial crisis, prices were low, business was depressed and but few men had the courage, notwithstanding they had the stock, to make extensive tours with their herds. For these reasons the exhibit of 1895 should be considered as what we *did* do and not what we *can* do.

STOCK OF NUNNELLY BROS., FULTON, MO.,

Breeders of Chester White and Victoria swine, fancy poultry and dogs.

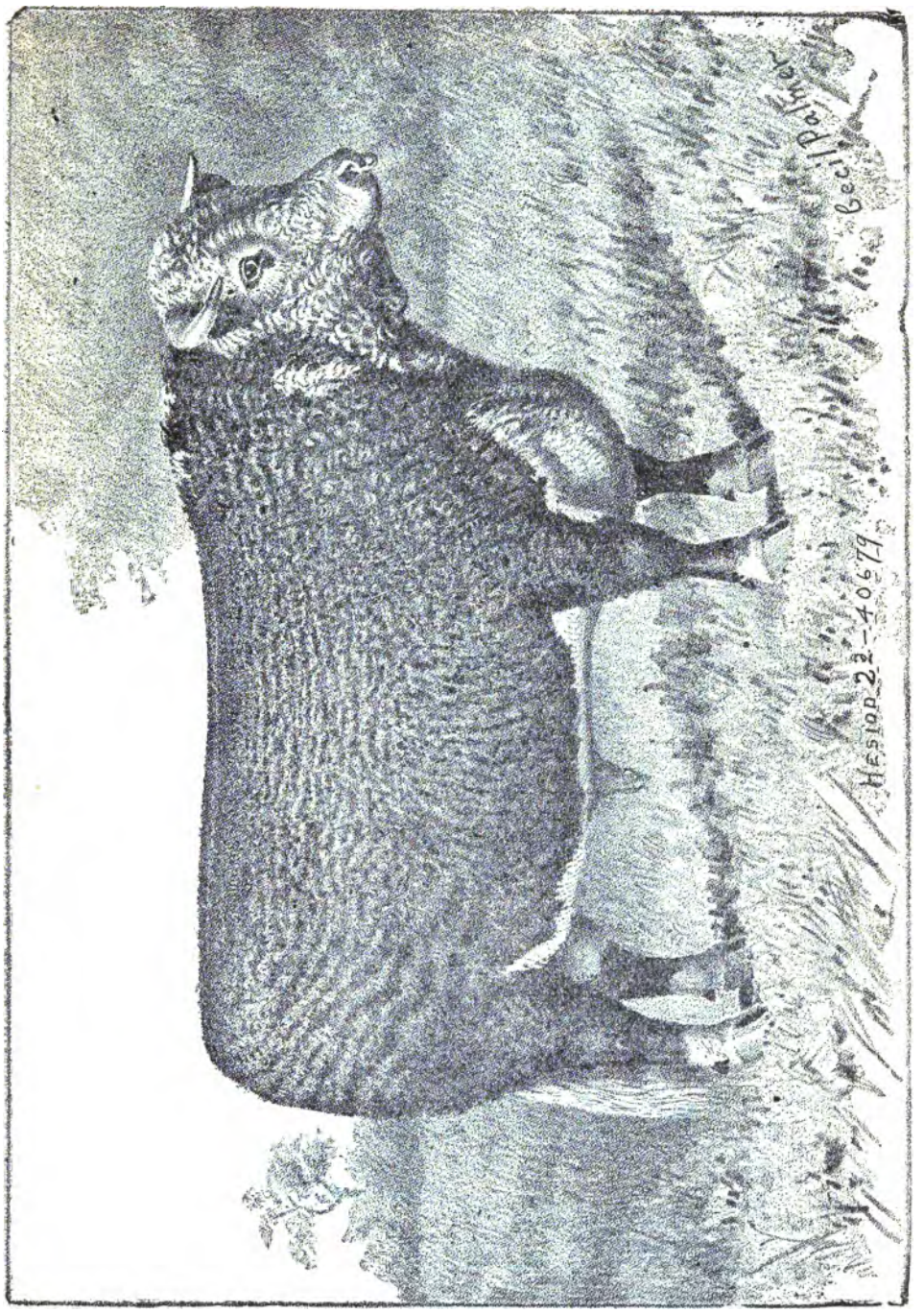


Victoria boar, "None Such" 1020, at 14 months old. Weight 500 pounds. Owned and exhibited by Nunnelly Bros., winning first prize as a yearling; also in sweepstakes over seven competitors at the St. Louis Fair in 1894; also 1st in class and sweepstakes in 1895.

Nunnelly Bros. also won the following premiums on Victoria swine at St. Louis, in 1895:

Class.	Premium.
Boar, 2 years and over	First
Boar, under 6 months	"
Sow, under 6 months	"
Sow and litter of 5 pigs	"
Boar	Sweepstakes

HEREFORD HERD, PLATTSBURG, MO.



Property of Jas. A. Funkhouser, Plattsburg, Mo.

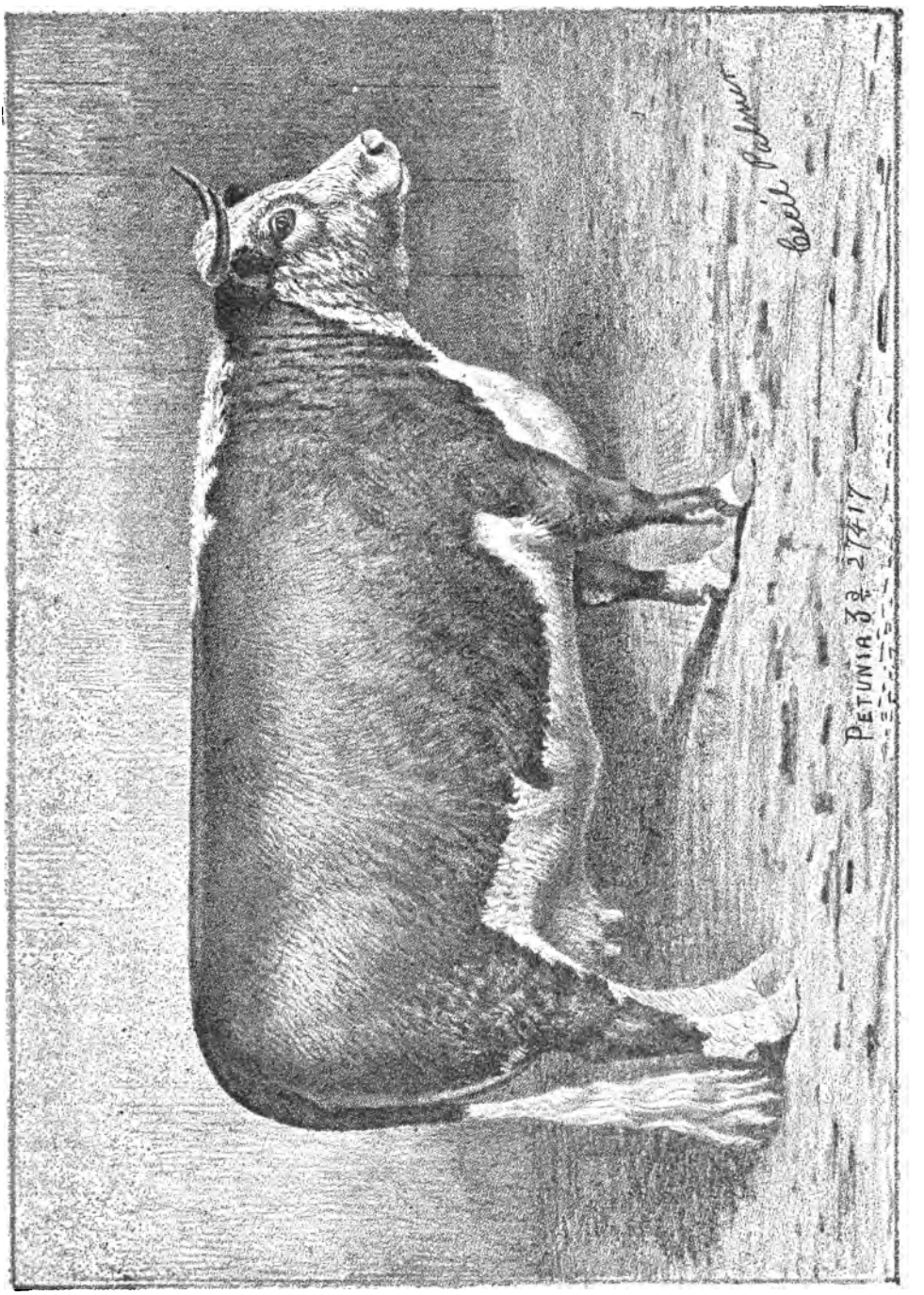
Hesiod 2d, 40697—First prize in class and sweepstakes Hereford bull at Kansas City, Mo., 1892.

Second prize in class at Peoria, Ill., 1892.

First prize in class and sweepstakes Hereford bull at Des Moines, Ia., St. Joseph, Mo., and Kansas City, Mo., 1893.

Second prize in class and sweepstakes Hereford bull at Lincoln, Neb., 1893.

Petunia 3d, 27417—First prize in class at St. Joseph, Mo., and Kansas City, Mo., 1892.



Sweepstakes as best cow any breed with calf at side, Peoria, Ill., 1892.

First prize in class at St. Joseph and Kansas City, 1893.

First prize in class and sweepstakes Hereford cow at Lincoln, Neb., 1893.

Premiums won by Jas. A. Funkhouser, Plattsburg, Mo, on Hereford cattle 1895:

ST. JOSEPH.

Class.	Premiums.
Bull, 2 years and over	First
Bull calf	"
Cow, 3 years old and over	"
Heifer, 2 years and under 3	"
Heifer, 1 year and under 2	"
Calf, heifer	"
Bull, any age or breed	Sweepstakes
Cow, any age or breed	"
Aged herd, any breed	"
Young herd, any breed	"

SPRINGFIELD, ILL.

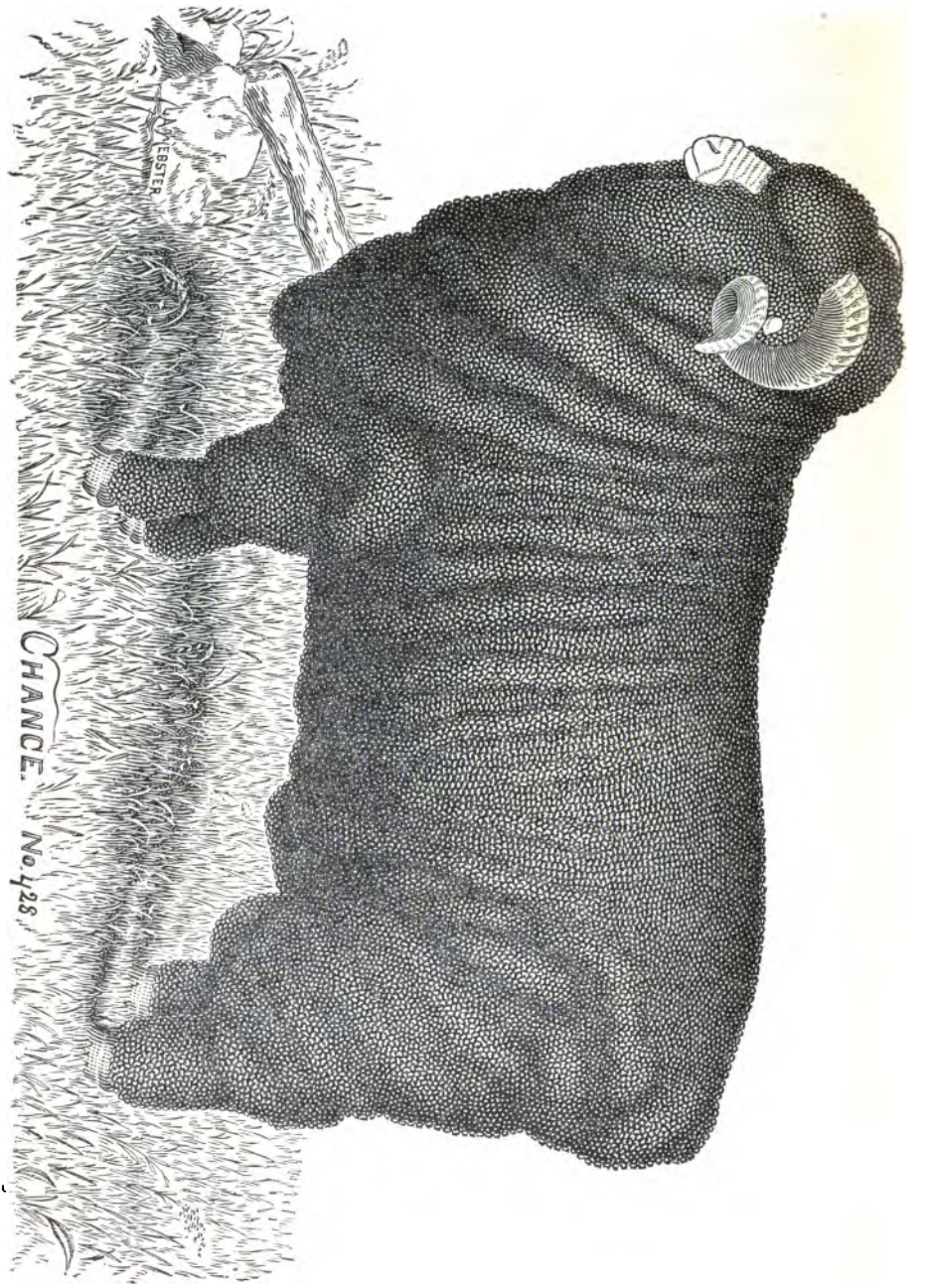
C ass.	Premiums.
Bull, 2 years old	First
Bull calf	"
Heifer, 2 years old	"
Heifer calf	"
Aged herd	Second
Young herd	"

ST. LOUIS.

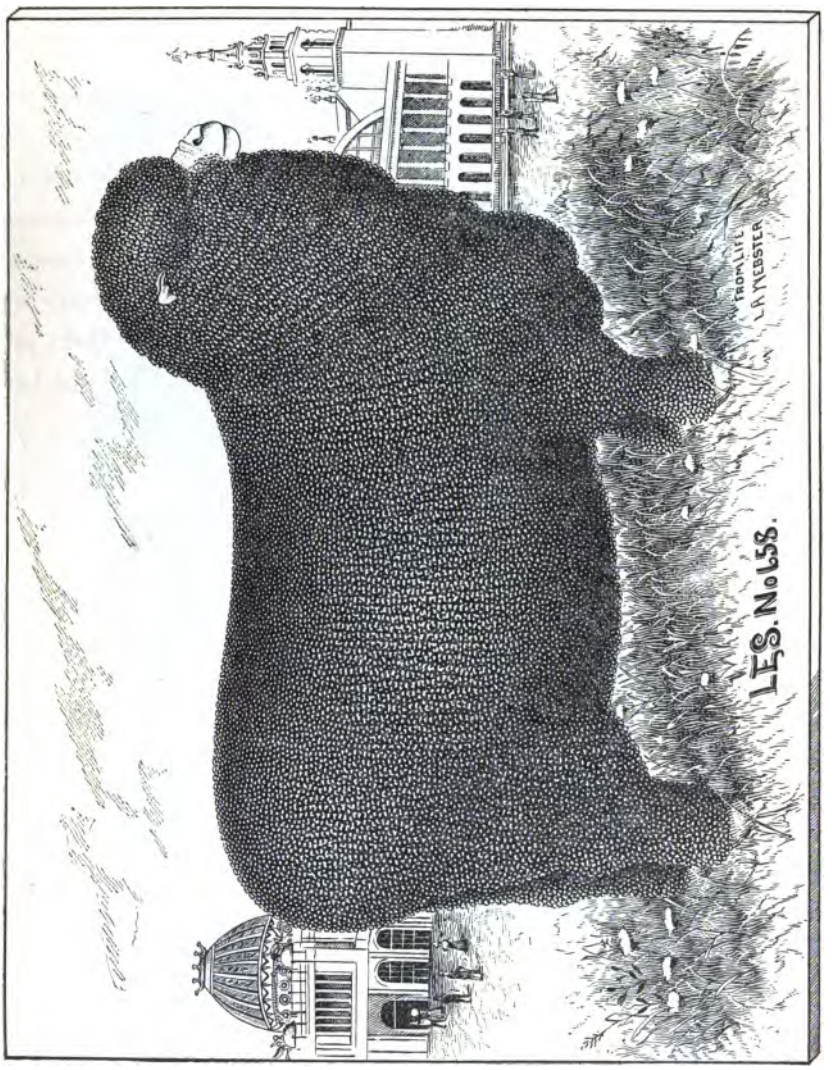
Class.	Premiums.
Bull, 2 years old	First
Bull calf	"
Heifer, 2 years old	"
Heifer calf	"
Bull, 2 years old and over	Sweepstakes
Herd, aged	Second
Herd, young	First
Get of bull	"

PRIZE WINNING MERINOS, STANBERRY, MO.

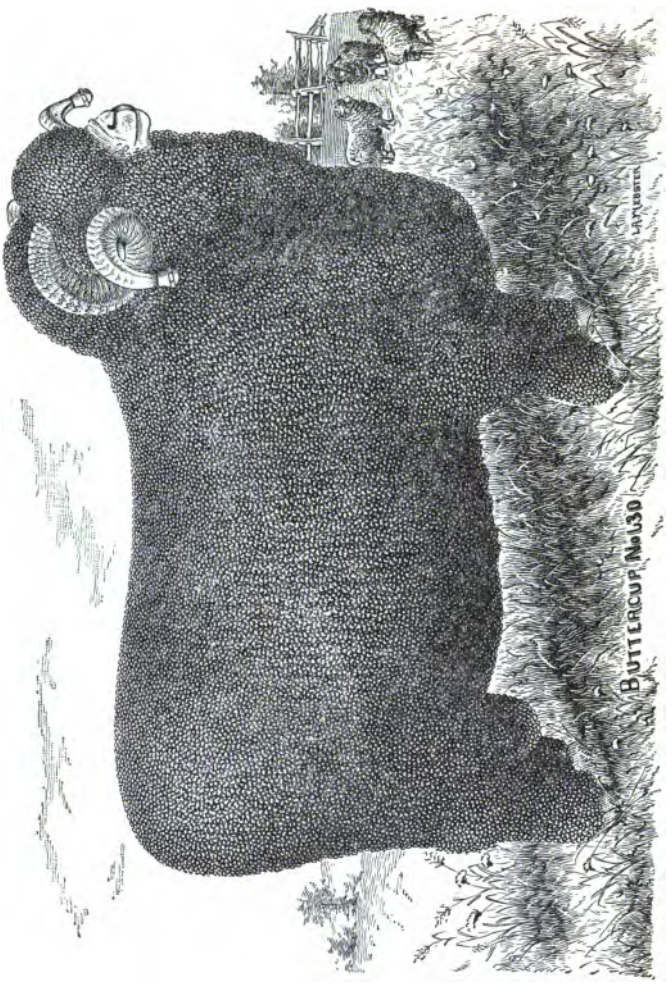
Bred by L. E. Shattuck, Sr., Stanberry, Mo. Chance sired more World's Fair winners than any other ram. He was sire of sweepstakes



ram and ewe in Merino Class B at World's Fair. Is grand sire of first prize and sweepstakes ram, and great grand sire of first prize ram lamb at St. Louis, 1895. His progeny have been winners wherever exhibited, and take high rank among the most noted animals in the world.



Property of L. E. Shattuck, Stanberry, Mo., sweepstakes Delaine ewe at World's Fair, 1893.



Property of L. E. Shattuck, Stanberry, Mo., first prize winner and sweepstakes Delaine ram, at St. Louis, 1895.

Winnings of L. E. Shattuck, of Stanberry, Mo., at St. Louis, 1895:

ON MERINO SHEEP.

Class.	Premium.
Ram, 2 years old and over	First
Ram, 1 year and under 2	Second
Ram lamb, under 1 year	First
Ram lamb, under 1 year	Second
Ram lamb, under 1 year	Third
Ewe, 2 years and over	Second
Ewe, 1 year and under	"
Ewe lamb, under 1 year	"
Ram, any age; ewe, 2 years or over; ewe, 1 year and under 2, and ewe lamb under 1 year	"
Ram, any age	Sweepstakes

ON DELAINE MERINO SHEEP.

Class.	Premium.
Ram, 2 years old and over	First
Ram, 1 year and under 2	"
Ram lamb under 1 year	"
Ewe, 2 years and over	"
Ewe, 1 year and under 2	"
Ewe lamb under 1 year	"
Flock—ram, any age; ewe, 2 years old and over; ewe, 1 year old and under 2; ewe lamb, under 1 year	"
Ram, any age	Sweepstakes
Ewe, any age	Sweepstakes

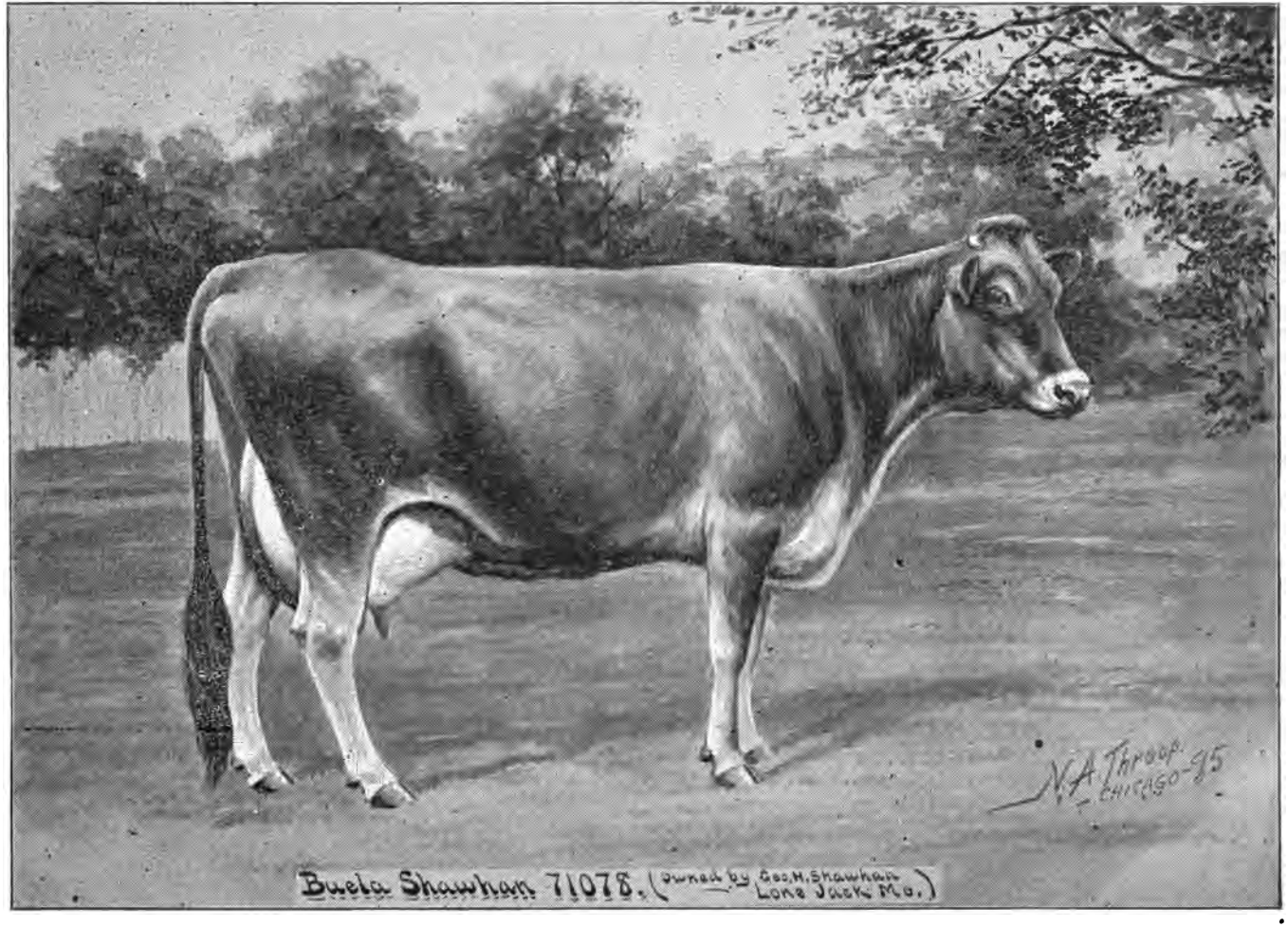
Premiums won by Geo. H. Shawhorn, of Lone Jack, on Jerseys, 1895:

DES MOINES, IOWA.

Class.	Name.	Premium.
Bull, aged	Etho Tormentor	Third
Yearling bull	Sir Midnight	Third
Bull calf	Unnamed	Third
Cow, aged	Bula Shawhan	First
Cow, 2 years old	Mattie Signal	First
Heifer, yearling	Bettie of Lone Jack	First
Heifer, yearling	R. Boys' Girl	Third
Heifer calf	Good Looking	First
Herd, aged		First
Herd, yearling		Second
Herd, calf		First
Cow, aged	Bula Shawhan	Sweepstakes

OMAHA, NEBRASKA.

Class.	Name.	Premium.
Bull, aged	Ethlo Tormentor	First
Bull, 2 years old	Petitts' St. Lambert	First
Bull, yearling	Sir Midnight	Third
Bull calf	Unnamed	First
Cow, aged	Mate of Elin Springs	First
Cow, aged	Bula Shawhan	Second
Cow, 2 years old	Mettie Signal	First
Heifer, yearling	R. Boy's Girl	First
Heifer, yearling	Goynell Esterbrook	Third
Heifer, calf	R. Boy's Rainbow	First
Heifer, calf	Good-looking	Second
Heifer, calf	R. Boy's Happy Maid	Third
Bull, any age	Petitt's St. Lambert	Sweepstakes
Cow, any age	Mate of Elinsprings	Sweepstakes



Property of George H. Shawhan & Son, Columbia, Mo., Bula Shawhan, won 1st and sweepstakes at Iowa, Newbraska and Illinois State Fairs, and sweepstakes at St. Louis Fair in 1895. She was a great winner in 1894; also at the World's Fair, and has a butter test of 19 pounds and four ounces made as a two-year-old.

OMAHA, NEBRASKA—Continued.

Class.	Name.	Premium.
Produce of Dam		First
Herd, aged		First
Herd, aged		Third
Get of Sire		First

SPRINGFIELD, ILL.

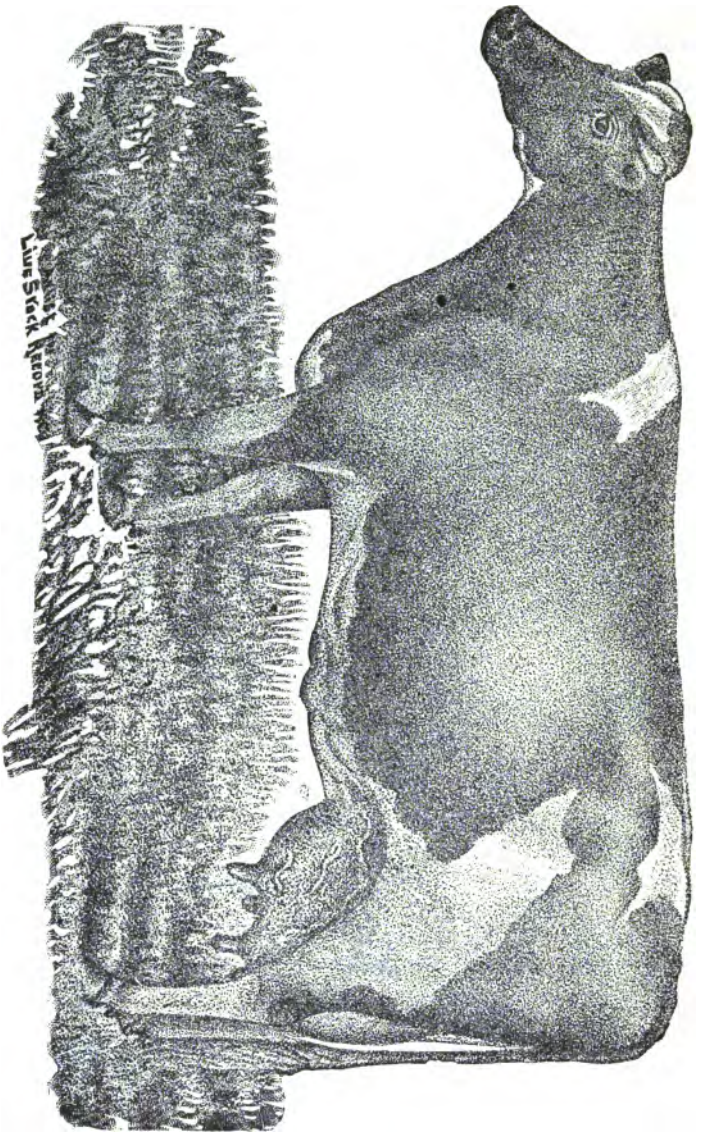
Class.	Name.	Premium.
Bull, 2 years old	Petitt's St. Lambert	First
Bull, yearling	Sir Midnight	Second
Cow, aged	Bula Shawhan	First
Cow, aged	Bula Shawhan	Sweepstakes
Cow, 2 years old	Mattie Signal	Third
Produce of Dam		Third
Herd, aged		Third
Herd, young		Third

ST. LOUIS, MO.

Class.	Name.	Premium.
Bull, any age	Petitt's St. Lambert	Second
Bull, yearling	Sir Midnight	Third
Cow, aged	Bula Shawhan	Second
Cow, aged	Bula Shawhan	Sweepstakes
Calf	Mo-Jo-Mine	First
Bull	Ethlo Tormentor	Sweepstakes
Produce of Dam		Second
Get of Sire		Third
Herd, young		Third
Herd, aged		Third

NOTE—At St. Louis and Springfield over one hundred Jerseys were on exhibition from New York, Pennsylvania, Kansas, Illinois and other states.

Empress Josephine, property of Col. M. E. Moore, Cameron, Mo. A great prize winner and one whose descendants are said to have won more prizes in butter and milk tests than any other cow of the Holstein Fresian breed.



Premiums won by M. E. Moore, Cameron, Mo., on Hereford cattle 1895:

MINNESOTA STATE FAIR.

Class.	Name.	Premium.
Aged bull	Chief Maple Hill, 4th	First
Aged bull	Chief Maple Hill, 4th	Sweepstakes
Yearling bull	Gerben Mechthildes Sir Henry	Second
Bull calf	Parthenea's Sir Henry	First
Aged cow	Boutje P, 2nd	Second
2 year old cow	Carlotta 2nd Josephine	"
Yearling heifer	America Parthenea	First
Heifer under 1 year old	Delores Parthenea	"
Heifer under 1 year old	Parana Abbekirk's Lady Pathenea	Second
Aged herd		Sweepstakes
Breeders, young herd		First

INDIANA STATE FAIR.

Class.	Name.	Premium.
Yearling bull	Gerben Mechthilde's Sir Henry	Second
Bull calf	Parthenea's Sir Henry	First
Aged cow	Boutje P, 2nd	"
Aged cow	Boutje P, 2nd	Sweepstakes
Yearling heifer	America Parthenea	First
Heifer under 2 years old	America Parthenea	Sweepstakes
Aged herd		"
Breeders, young herd		First

ILLINOIS STATE FAIR.

Class.	Name.	Premium.
Aged bull	Chief of Maple Hill	First
Aged bull	Chief of Maple Hill	Sweepstakes
Yearling bull	Gerben Mechthilde's Sir Henry	Second
Bull Calf	Parthenea's Sir Henry 2nd	First
Aged cow	Boutje P. 2nd	"
Aged cow	Boutje P. 2nd	Sweepstakes
Heifer, 2 years old	Carlotta 2nd's Josephine	Second
Yearling heifer	America Parthenea	First
Heifer, under 2 years old	America Parthenea	Sweepstakes
Heifer, under 1 year old	Delores Parthenea	First
Aged herd		Sweepstakes
Breeders, young herd		First

ST. LOUIS.

Class.	Name.	Premium.
Aged bull	Chief of Maple Hill, 4th	First
Aged bull	Chief of Maple Hill	Sweepstakes
Yearling bull	Gerben Mechtilde's Sir Henry	Second
Bull calf	Parthenea's Sir Henry	First
Aged cow	Boutje P. 2nd	"
Aged cow	Boutje P. 2nd	Sweepstakes
Heifer, under 1 year old	Delores Parthenea	First
Aged herd		Sweepstakes

Premiums won by Risk & Gabbart, of Weston, Mo., on Poland China hogs, 1895 :

IOWA STATE FAIR.

Class.	Premium.
Boar, 1 year old	First.
Boar, under 6 months	Third
Boar, any age	Sweepstakes.
Sow, 2 year old	Third
Sow, yearling	Second
Sow, 6 months and under 1 year	First
Sow pig, under 6 months	"
Herd, prize boar and 4 sows	Sweepstakes.

NEBRASKA STATE FAIR.

Class.	Premium.
Boar, yearling	First
Boar, under 6 months	Third
Sow, 2 year old	Second
Sow, yearling	"
Sow, yearling	Third
Sow, 6 months and under 1 year	First
Sow, 6 months and under 1 year	Third
Sow, under 6 months	First
Aged herd, boar and 3 sows	"
Young herd, boar and 3 sows	"

ILLINOIS STATE FAIR.

Class.	Premium.
Boar, 1 year old	First
Boar, any age	Sweepstakes
Herd, prize boar and 3 sows	"

ST. LOUIS.

Class.	Premium.
Boar, 1 year old	First
Boar, 1 year old	Third
Sow, 2 years old	Second
Sow, 1 year old	Third
Sow, under 1 year old	"
Sow, any age	Sweepstakes
Herd, boar and 3 sows	First
Herd, boar and 3 sows bred by exhibitor	"
Four swine, the get of 1 boar	"

Premiums won by Wallace Estill, Estill, Mo., on Polled Angus cattle 1895:

SPRINGFIELD, ILL.

Class.	Premium.
Bull, under 2 years	First
Bull, under 2 years old	Second
Heifer, under 2 years old	First
Heifer, under 2 years old	Second
Heifer, under 1 year old	First
Heifer, under 1 year old	Third
Herd, young	First
Get of one sire	Second
Produce of cow	"
Heifer, under 2 years old	Sweepstakes
Bull, under 2 years old	"

ST. LOUIS.

Bull, under 2 years old	First
Bull, under 2 years old	Second
Heifer, under 2 years old	First
Heifer, under 2 years old	Second
Young herd	First
Get of one sire	"
Produce of cow	Second
Heifer, under 2 years old	First

IOWA STATE FAIR.

Class.	Premium.
Bull, 1 year old	First
Bull, 1 year old	Second
Bull, under 1 year old	First
Heifer, under 2 years old	Second
Bull, 1 year old	First, sweepstakes, all breeds competing
Heifer, under 1 year old	" " "
Get of one sire	" " "
Produce of cow	Second, sweepstakes, all breeds competing
Yearling herd	First, all breeds competing
Herd, under 1 year old	First

NEBRASKA STATE FAIR.

Class.	Premium.
Bull, under 2 years old	First
Bull, under 2 years old	Second
Bull, under 1 year old	First
Bull, under 1 year old	Second
Heifer, under 2 years old	First
Heifer, under 2 years old	Second
Heifer, under 1 year old	First
Heifer, under 1 year old	Second
Young herd	First, sweepstakes
Young herd	Second, sweepstaks.
Produce of cow	First, sweepstakes
Get of one sire	"
Bull	"

Property of, N. H. Gentry, Sedalia, Mo., winner of first prize as best Berkshire boar, 1 year old, and first as best boar, any age, at St. Louis, Indianapolis, and Springfield, Ill., in 1895; also head of winning show herd at St. Louis and Springfield.

Premiums won by N. H. Gentry, Sedalia, Mo., on Berkshire hogs, 1895:

ILLINOIS STATE FAIR.

Class.	Premium.
Boar, over 2 years old	First
Boar, over 2 years old	Second
Boar, 1 year and under 2 years	First
Boar, 6 months and under 1 year	"
Boar, 6 months and under 1 year	Second
Boar, 6 months and under 1 year	Third
Sow, over 2 years	First
Sow, over 2 years	Second
Sow, 1 year and under 2 years	First
Sow, 1 year and under 2 years	Second
Sow, 1 year and under 2 years	Third
Sow, over 6 months and under 1 year	First
Sow, over 6 months and under 1 year	Second
Herd, boar and four sows over 1 year	First
Herd, boar and four sows under one year	"
Sow and litter of pigs	"
Four pigs, the get of one boar	"
Boar, any age	"
Sow, any age	"

ST. LOUIS FAIR.

Class.	Premium.
Boar, over 2 years old	First
Boar, over 2 years old	Second
Boar, 1 year old and under 2	First
Boar, 1 year old and under 2	Second
Boar, 6 months old and under 1 year	First
Boar, 6 months old and under 1 year	Second
Sow, over 2 years old	First

ST. LOUIS FAIR—Continued.

Class.	Premium.
Sow, over 2 years old	Second
Sow, 1 year old and under 2	First
Sow, 1 year old and under 2	Second
Sow, 6 months old and under 1 year	First
Sow, 6 months old and under 1 year	Second
Boar, any age	First
Sow, any age	"
Boar and 3 sows, over 1 year	"
Boar and 3 sows, over 1 year, bred by exhibitor	"
Boar and 3 sows, under 1 year	"
Boar and 3 sows, under 1 year, bred by exhibitor	"
5 head of swine, any age, the get of 1 boar	"

COTTON STATES' INTERNATIONAL EXPOSITION, ATLANTA, GA.

Class.	Premium.
Boar, 1 year old and under 2	First
Boar, 6 months old and under 1 year	"
Sow, two years old and over	"
Sow, 1 year old and under 2	"
Sow, 1 year old and under 2	Second

Premiums won by Rolla Oliver, of Dearborn, Mo., on Jerseys, 1895:

KANSAS STATE FAIR.

Class.	Name.	Premium.
Bull, aged	Boom, 24600	First
Bull, 2 year old	Aeneas	Second
Bull calf	Unnamed	"
Cow, aged	Comra, 38886	First
Cow, 2 years old	Diploma's Bird, 100365	Second
Heifer, yearling	Boom's Carmen, 108110	"
Jersey herd		"
Herd dairy breeds		Grand sweepstakes
Herd breeding cattle		First
Young herd, bred by exhibitor		"
Bull and 4 of his get	Boom, 24600, and 4 calves	"

Premiums won on saddle horses at St. Louis Fair, 1895 :

Class.	Name.	Prem.	Owner.
High school ring, saddle mare	May Queen.	Second..	C. W. Crowley...
Saddle horse, gelding, 4 years and over	Jim Dandy..	Second..	Ed. Mallinckrodt.
Saddle-driving horse	Jim Dandy .	First....	Ed. Mallinckrodt.

ST. LOUIS.

Class.	Name.	Prem.	Owner.
Clydesdale stallion	Energetic	Second	A. H. Marchander, Shrewsbury
Saddle pony under 14 hands high		"	C. M. Hill, Warrenton
Shetland ponies, best team in harness	Iago & Ingomar	First.	J. B. Sickles, St. Louis
Best tandem team	Iago & Ingomar	"	J. B. Sickles, St. Louis
Single driving pony	Iago	"	J. B. Sickles, St. Louis
Coupe ring		Second	T. T. Rubey, St. Louis
Roadster, horse driven by owner	Forest Bird.	"	J. P. Arnold, Williamsburg
Buggy horse	Forest Bird.	"	J. P. Arnold, Williamsburg
Saddle stallion	Dick Forest.	"	J. P. Arnold, Williamsburg
Roadster stallion, 3 years old	Pay Down, 25800		Will R. King, Marshall

Master Joseph T. Potts, Mexico, Mo., aged 14 years, and his prize winning pony, Snow Flake, by Arabian Hal, an imported Arabian. Joseph T. was winner of first prize at St. Louis in 1894 and 1895, and at Kansas in 1895 offered for best boy rider. Snow Flake won first at the same times and places as best saddle pony, any age or breed.

PIKE COUNTY JACK FARM.

The Largest in the World.

Missouri has in this establishment the largest breeder and importer in the world. The importations amount annually to from 200 to 400 head and a large number are bred on the farm from the best prize winning animals. The farm is located at the junction of the C. & A. and the St. Louis & Hannibal railroads, and is properly equipped for the care of this large number of valuable animals.

In addition to sales made in the United States the proprietor has a profitable trade with Nova Scotia, Australia, West Indies, South America and Mexico.

The quality of the stock handled is attested by the prizes awarded wherever exhibited. We are unable to give a detailed report of awards for 1895, but below we give the winnings at St. Louis and Dallas Texas:

ST. LOUIS.

Class.	Premium.
Jacks	First
Mules	Sweepstakes
Span mules	First
Mule	First

DALLAS, TEXAS.

Class.	Premium.
Jacks	First
Mules	First
Mules	Second

MISSOURI FRUIT FARM.

The Largest in the World.

This State has in the Olden Fruit Farm at Olden, Missouri, probably the largest fruit farm in the world. It consists of 2280 acres planted to apples, peaches, pears, plums, cherries and berries, and large additions are being made every year. Cold storage rooms are provided for the care of the fruit and sales are made by the train load at the orchard.

This orchard and its success was the beginning of a great boom in the fruit interest of Howell and other South Missouri counties. Young orchards, some of them very extensive, have been put out on almost every farm. Fruit is discussed wherever men or women congregate, either in private or public. The fruit in quality, color and flavor is very superior. Its reputation is already established abroad, and buyers come to the county to make purchases. It is fast developing into a great fruit center. New railroads are in contemplation and in the near future train loads of luscious fruit will be shipped to the markets of the world.

A shippers' organization has been effected, embracing the counties of South Central Missouri, the object of which is to place the shipping of fruit from this locality under one management, thereby giving the small grower the same advantage as the larger ones in regard to shipping rates, refrigerator cars and better markets.

Through the kindness of Dr. Paul Evans we have been furnished and herewith print, for the benefit of other localities who desire to take similar action "The Articles of Association" and "Rules for Picking, Packing and Marketing Fruit," that have been adopted by the South Central Missouri Fruit Growers' Association. What has been done in Howell county may be done in other localities in Missouri, and the fruit industry, now in its infancy, may be developed until our fruits will be known and appreciated in every market in the world.

ARTICLE I.

ARTICLES OF ASSOCIATION.

SECTION 1 This Association shall be known as the South Central Missouri Fruit Growers' Association.

SEC. 2. The object of the Association shall be to facilitate packing, shipping and marketing fruits and other products to the best possible advantage for its members. This would include the obtaining of rates, improved methods and the best markets, also the procuring of necessary supplies.

SEC. 3. The principal place of business shall be West Plains, Howell county, Missouri.

SEC. 4. Membership: Any person engaged in growing fruit or other products for market, and who has subscribed to the articles of this Association, and who will be governed by the rules and regulations of the Association as they now are, or as they may be adopted from time to time, and has paid the dues as called for by said articles, shall be considered a member of this Association.

SEC. 5. The officers of this Association shall consist of a President, Vice-President, Secretary and Treasurer. There shall be fifteen Directors, all of whom shall be members and shall be elected by the members; and their term of office shall be one year, or until the next ensuing annual meeting. The Directors shall elect the President, Vice-President and Treasurer from among their number and shall appoint a Secretary at their first meeting after the election.

SEC. 6. All business of this Association shall be managed by an Executive Committee, consisting of the President, Secretary and three Directors, to be chosen by the Board from among their number.

SEC. 7. The annual meetings of this Association shall be held on the last Saturday of January in each year. All voting shall be by ballot. Vacancies in the Board or any of the offices shall be filled by the Board of Directors at a meeting called for that purpose, or at their next regular meeting after such vacancy occurs.

SEC. 8. Any officer may be removed by a two-thirds vote of the Directors at any meeting of the Board, all Directors having been duly notified that such case will be acted upon at such meeting, provided a copy in writing of the charges preferred against him shall be furnished him at least ten days before such meeting, and he shall have opportunity of making defense thereto. Any member may be expelled under the same provisions.

SEC. 9. The regular meetings of the Directors shall be held on the second Mondays in April, June, September and December, respectively, in each year.

SEC. 10. Special meetings of the Board may be called by the President and shall be called by him at the request, in writing, of ten members. A written notice shall be mailed to each Director at least forty-eight hours before the time set for any meeting.

SEC. 11. It shall be the duty of the President to preside at all meetings and in connection with the Secretary to sign all orders issued by the Board. He shall vote only in case of a tie.

The Vice-President shall perform all duties of the President in his absence.

The Secretary shall keep all records of the meetings, attend to all correspondence and conduct all business of the Association, under instructions from the Executive Committee. He shall make all collections of moneys except as hereinafter provided, paying same over forthwith to the Treasurer, taking his receipt therefor. He shall devote his entire time to the duties of his office and for his compensation shall receive not less than eighty-five dollars per month. He shall be required to give such bond as the Executive Committee may approve in the sum of five thousand dollars. (See note on page 252.)

The Treasurer shall receive all moneys from the Secretary and give him receipts for the same, and shall pay all orders properly signed by the President and attested by the Secretary. He shall report at the regular meetings of the Directors the amount of money received and paid out since the last report, and at the annual meetings in January he shall make a full and complete report of the financial condition of the Association. He shall give a good and approved bond of not less than five thousand dollars.

SEC. 12. The membership fee in this Association shall be two dollars, which amount shall be paid to the Secretary within ten days from the time the articles are signed. The money so received shall be used in furthering the objects of this Association and in getting it into working order and to a point where it is self supporting.

A percentage will be charged on the net proceeds of each shipment towards defraying the necessary running expenses; the amount of such percentage to be fixed by the Executive Committee.

ARTICLE II.

RULES AND REGULATIONS.

SECTION 1. The members of this Association shall make at least 90 per cent of their shipments through the Association, except that any member may ship full car lots independently by paying into the Association a nominal fee on each car.

SEC. 2. Any member or members of the Association who ship in independent cars to points reached by the Association, or who individually or collectively ship in competition with the Association, shall be deemed as working against the interest of the Association, and upon proper proof of such facts to the Board of Directors they shall forfeit their membership.

Parties other than members may be permitted to ship through the Association upon such terms and conditions as the Board of Directors may specify.

SEC. 3. Members shall conform to the regulations established by the Board of Directors as to handling, packing, grading and marking fruit and other products shipped through this Association.

SEC. 4. All proceeds of any shipment for a member of this Association amounting to fifty dollars or more may be remitted for direct by the consignee to the member, as he may instruct, less the charges of the Association, which charges are to be sent to the Secretary of the Association.

CHAS. S. WHEELER, Chairman,
J. C. EVANS,
S. W. GILBERT,
D. J. NICHOLS,
PAUL EVANS,
M. B. CLARKE,
H. S. GRANT,
C. J. TROWBRIDGE, Secretary,
Committee.

NOTE—The foregoing articles of association were adopted at an adjourned meeting of fruit growers held at the court-house in West Plains, July 27th, 1895. A board of directors was elected to serve until the first regular election in January, and the executive committee was instructed to take such measures as might be necessary to afford immediate benefit to the fruit growers, but to postpone the payment of the regular salary to the secretary, the furnishing of bonds by secretary and treasurer, and the other requirements of the articles, at their discretion, until the first regular election.

PICKING, PACKING AND MARKETING FRUIT.

Report submitted to the South Missouri Horticultural Association at West Plains, July 13th, 1895.

Our purpose has been to gather and arrange for the South Missouri Horticultural Association and for all the fruit growers of Howell county the fullest and best information on our subject, such as may be a practical guide to the inexperienced, with some new and useful suggestions to all. With this aim we sought and have been kindly accorded the assistance of Col. J. C. Evans, President; Hon. L. A. Goodman, Secretary, and Hon. A. Nelson, Treasurer, Missouri State Horticultural Society; Hon. Geo. T. Powell, of New York, noted as a lecturer on horticulture; Geo. W. Barnett, of Chicago, President of the National League of Commission Merchants, and Col. Louis Erb, the well known commission merchant of Memphis, owner of the extensive Cedar Gap Fruit Farm. Valuable material has also been collected from the Horticultural Reports of Missouri and other states. This acknowledgement is made at the outset, in order that you may take this paper at its full value, as mainly a condensation of what we have gathered from the high authorities named. We will first refer to our fruits separately in the order in which they are marketed, and will follow with such matter as relates more or less to all.

STRAWBERRIES.

Pick as soon as evenly colored, just before fully ripe, always with stems on. Pinch off stems with the nail, about an inch from the berry. Carefully avoid bruising, which causes fruit to bleed, when it soon sours and is valueless. Never pick when berries are wet or soft; keep them constantly cool after picking. Pick only berries of uniform ripeness; two or three green, over-ripe or imperfect berries will render a box of otherwise choice fruit unsalable. Go over the rows at least every day; whatever the quantity of ripe berries obtained and whatever you do with the fruit, keep over-ripe berries off your plants. Pick in two grades, and don't ship the second; a good picker will soon learn to grade properly. Turn out a box now and then as brought in by pickers, and discharge any picker detected a second time in careless picking. You cannot maintain your correct standard otherwise. Fill boxes as full as possible, and do not fear rounding up; the fruit settles in transit and a little pressure on top berries is preferable to the shaking up from slack boxes. Leave no space between top tier

and cover; a layer of leaves protects and freshens the berries, especially if shipping small lots by express. Use only new, perfect boxes and crates, 24 boxes to the crate, and be sure that they are dry. The Leslie box is recommended. Stencil handsomely and cleanly. Always use tickets or card and punch for pickers, and in large fields work them in squads.

The strawberry is the fruit of the million and constantly becoming more popular. The grower who can market choice, uniform strawberries, not expensively raised, will always find a profit, and the means of doing this cannot be too closely studied.

RASPBERRIES.

Handle same as strawberries, except they should be fully ripe when picked and need not be graded. Pick as soon as they will slip from the stem. They must be handled more quickly then strawberries as they mold easily. The red raspberries do not stand long shipments but are such a prime favorite with all lovers of fruit that it pays to get them to market when possible. In picking them, give berries a roll between the thumb and finger instead of pinching them. A good picking device for raspberries and blackberries is a tin box, attached to a waist belt, into which the berry box is set. It has a hinged cover with funnel-shaped hole to admit berries; this prevents waste and leaves both hands free to pick.

BLACKBERRIES.

Blackberries will stand shipping longer distances (picked when just ripe) than other berries, as they are less likely to mold or decay. Handle about the same as other berries.

CHERRIES.

Pick as soon as well colored. Always leave stems on the fruit and handle by them. Ship in quart boxes same as berries; grape baskets will do if not to go too far; fill top of boxes so stems are not exposed. If very fine, it pays to layer the fruit; assort carefully.

PLUMS.

Pick when not quite ripe—when changing color, if for express shipment. If for freight, pick green, though they must be fully grown. Let no soft plums go in. Pack in berry boxes of four basket crates if quite ripe. If hard, pack in one-third bushel boxes. Handle plums so as to preserve their bloom. Fancy varieties will pay to wrap in paper like the California plums. Wild Goose plums may be shaken from trees on sheets.

PEACHES.

Pick just when they have a good color and the green becomes yellowish—while still hard. Use half-bushel picking baskets, and take great care not to bruise the fruit. Don't empty the picking baskets; pack from them. Pickers should pick and packers should pack. Young men make the best pickers, working by the day. Women and girls make the best packers. Grade carefully, using a board with holes in to guage sizes. Rigidly reject all over-ripe or blemished fruit. Make three grades—Extra, No. 1 and No. 2. Wrap the extras in tissue paper and pack in trays, 16 by 16 inches, three inches deep, holding one tier each. Ship in packages of six trays each, held together by strips nailed on sides, with cover on top tray. No. 1 peaches may be shipped one-third bushel boxes, or four and six basket crates. In packing boxes set them on edge, not flat, and lay the peaches in rows along the sides with the stem ends inward, filling in the center carefully; if packed thus, unbroken rows of well colored fruit will show at all openings and not a peach can move. Let every package show just what it contains, however. Covers, when nailed down, should press fruit. Choice or mellow peaches may be put in 8-pound baskets, with slatted covers, and it is a good plan to put excelsior on top to hold the fruit solid. Compartment boxes, like egg cases, are also used for choice fruit. It is well to stencil the name of variety on package. Do not ship your No. 2 grade of peaches.

GRAPES.

Pick when just ripe, never before, nor when too ripe. Protect the bloom as much as possible. Pick in convenient baskets and, at packing place, remove all green and imperfect grapes with scissors. Hold two days before packing if to be shipped long distances. Pack early grapes in 5-pound baskets, later in 9 or 10-pound baskets. Shake down well and fill baskets full. Turn stems of top bunches out of sight and have the surface of the baskets smooth. The cover should press the fruit sufficiently to hold it firm. Stencil the variety in each basket on the cover.

APPLES.

Pick summer varieties as soon as ripe. Select the best and ship in bushel boxes. See that they are dry and cool before packing. Pick winter apples before fully ripe; they keep better and have better flavor. Be all ready for apple picking and packing by September 1. Ben Davis and some others may even be picked the last days of August. Two pickings of Ben Davis are recommended, about three weeks

apart. Never pick apples wet or allow them to get wet. Use baskets for picking, and it is a good plan to line them. A bag slung over the shoulders is good to pick into. Pick only such apples as are intended for shipment; don't hand-pick your culls. Separate your varieties closely. The best fruit is on the topmost branches, and therefore requires the most careful picking. Small home-made step-ladders will do for most of our Howell county orchards. Picking should be done under a foreman, and it is better to hire your pickers by the day. Let each picker chalk his name or number on every box or barrel filled by him and you can then know how much he does and how he does it. It is better not to pack from the trees for shipment, and the best authorities now advise against piling apples in orchards before packing. *Never,* and again *never*, haul shipping apples in a wagon a rod. Peel a few apples which have been hauled thus and held two or three days and you will find them covered with bruises. The best way is to haul from orchards, loading your wagon with empty shipping barrels, the bottom head taken out and left loose in the barrel, the top head (being at bottom in wagon) nailed in and all hoops nailed except those at the open end. Empty the pickers' baskets gently into the barrels. When filled, haul to cellar or other cool, ventilated place where you can stack the barrels on end with apples in. Apples need air, but must be protected from moisture. When ready to pack, prepare a packing table with canvas surface, somewhat like a cot-bed, but larger, and higher than a barrel, that will hold one or more barrels, according to your requirements. Put a raised rim around the edge to keep apples from rolling off. Have an opening at the end or side, about a foot across, around which nail the edge of a bottomless sack for a spout into the barrel. Empty your barrel of apples as hauled from orchard and stored (or your pickers' baskets if you must pack in the orchard) on your packing table and take the loose bottom head out of the barrel; then face it with two rows of apples, stem ends down (the real head of the barrel being, of course, underneath), and place it under the sack-spout.

Do not select apples for facing; pack honestly and put up every barrel as if for your own use. Throw out every bruised, wormy, small or misshapen apple. Put in no blemished apples, however handsome. The imperfect apples which did not so appear when picked can now be detected. If some apples are very large, pack them to themselves and mark them extra. Handle the fruit as little and as gently as possible until it reposes finally in the barrel. Your barrel being in position, have a 4-inch ring and a pin which will pass through the sack below the ring, holding it in place wherever you wish. Set them so that

when the sack is full of apples above them, you can remove the ring and pin and let the apples gently into the barrel. This will save you time, bruised apples and backache. Shake, or rather jar, the barrel often. Use a press for heading-up and have an experienced man for this. Contents of barrels must remain solid even if a few are crushed by the pressure. If held long after packing where there is any heat the barrels should be sprinkled occasionally to prevent the moisture being drawn from the fruit causing it to shrink and be loose in the package. An even, low temperature is important for apples, and 40 degrees Fahrenheit is considered the best. Use only new, tight, standard apple barrels, which, as adopted by the American Horticultural Society, have the same length of stave and diameter of head as the flour barrel. Nail all hoops on barrels, first tightening them; use very short nails on bulge; line both heads; stencil variety, growers' brand and shipping directions all on head of barrel. Put no mark whatever on lower end. Use no inferior barrels.

We come now to information and advice having a general relation to my subject.

PICKING.

Do your best to get experienced and careful pickers. Hire them by the day, except for picking berries. If picking on a large scale always have an extra man to every twelve pickers to watch the work, move ladders, handle fruit, etc.

Condition.—Dryness and as cool and even a temperature as practicable are essential to the preservation of all fruit. From the moment of picking it must be carefully protected from sun and moisture; the latter is the surest agent of fermentation and decay. Have your packing shed so arranged as to catch every breeze to help carry off the surplus heat and moisture in the fruit. All fruit should be cooled off before loading in the car; this is important as heat will increase in car.

SELECTION AND PACKING.

Choice, well handled, well selected fruit always finds a market when inferior fruit cannot be sold to cover expenses. The best commission houses do not want the business of careless packers. Quality, not quantity, is what every fruit shipper should strive for. The saying, "There is always room on top," is especially true in the fruit business. Never yield to the temptation to top off your packages. Put nothing in that you would be unwilling to see on the top. That is your safest rule. To arrange the top fruit to show to the best advantage is, of

course, advisable, just as you give a picture its best light. Remember your name or number is on every package and the dealer is guarding his own reputation, which depends on his handling attractive, uniform fruit. If he is deceived once only in your fruit he will remember and shun your goods thereafter be they ever so straight. You will get more for your selected fruit than you would for twice the quantity by letting the inferior fruit go in, besides saving labor, packages, transportation and reputation (and reputation is much to the fruit grower). Select carefully, not only as to size, but stage of ripening. Put into seperate packages all unripe or over-ripe fruit that finds its way to the packers, to be disposed of quickly or held longer, as the case may be, without spoiling the apperance and sale of the standard fruit. Get your packages and make them up in time to dry out before use. You should always have your own stencil from a regular stencil maker; this should give your name and address, and be sure to get "Howell county" on it. It should be attractive in style and as large as the space it is to be used on will permit; have different styles if necessary. If you belong to the shipping association of Howell county, as is presumed you will, the stenciling of your packages will doubtless be regulated by the association. If you have no stencil, a shipping tag (not a common card) tacked on smoothly, or a heavy lead pencil will suffice.

Never use large or irregular nails for fruit boxes or crates; they are unsightly. You must pack so that the "Howell county" mark on a package means standard quality, to be accepted without inspection. Such goods will be sought after when unknown brands, however well deserving, cannot obtain notice.

Hauling.—Do not carry tender fruits, if avoidable, in any but a spring wagon. Do not allow them to be loose in the package, and always cover them from sun, dust and rain. *Never carry any* fruits loose in the wagon. Time the movement of your fruit from the orchard or packing shed so that it will not stand long on the depot platform, and ship by night trains when possible.

Markets.—It is important to keep track of your markets. One market may be good one week and another the next. Your commission man cannot control conditions and you must not expect too much of him. In finding markets (aside from the question of profit) you have an ample safeguard against that bugbear of many, over-production; for if you seek them diligently you will surely find them. It is claimed that the market is never broken down by good fruit. As a rule, avoid solicitors and traveling buyers; deal direct with houses of well known standing, and do not scatter your shipments. In market-

ing your fruit, however, you are embarking upon an unknown and dangerous sea, without chart or compass, over which even the experienced captains we have called to your aid cannot pilot your small barks, and you must either stay ashore and sell your fruit to local buyers, without the means of knowing its actual market value, or you must put it aboard a ship big enough to carry it anywhere and under a guidance which knows the best ports and how to sail into them. We mean a fruit growers' co-operative shipping organization.

Organization will protect the transportation of your fruit in every way from the time you deliver it to the association shipping agent at your station. He handles it carefully into the car and the car goes intact to the association commission agent in some distant city, who does not handle and rehandle it (as does the express company in sorting and delivering to the various consignees), but delivers the contents direct to his customers as their orders come in, and they in turn get them to the consumers in the best possible condition. In the matter of railroad rates to any and all markets we need not tax your patience or question your intelligence by setting forth the immense advantage an association will have.

Organization accomplishes that all important object the finding of the best markets. The association's manager should receive daily advices, either by mail or wire, from reliable agents in every available city. Transportation charges would be closely watched. Railroad and express companies do not reduce their rates without knowing why they must do so to hold their business. Hon. Geo. T. Powell says: "The county would get its most valuable reputation to handle this fruit, especially apples, peaches and grapes, through an organization that puts its stamp of thoroughness and uniformity on everything that goes out." Co-operation in shipment is of the utmost importance to small shippers who cannot avail themselves of the market without it and with it have equal advantages with the large shippers. Beginners often let fine fruit waste because of having too small lots for shipment ready at any one time. "Refrigeration laughs at time," and no country has the monopoly of any market very long. California can sell fruit in the Chicago market in prime condition thirty days from the tree. Refrigeration will help immensely to market our fruit, however great the production, and renders the problem only one of the cost to grow and transport. Refrigerator car service can only be obtained for continuous large shipments through the organized co-operation of shippers.

Our apples must find their way to other countries in the near future and it is altogether possible that we may even ship our peaches to England. Peaches go there now from California and the Cape of

Good Hope, and why not as well from Missouri? "A really fine peach is never to be had in England for less than 8 cents." When the right time comes our shipping association can test the carrying qualities of our fruit by sending trial packages to the various markets of this and other countries and noting the results. We close with the prediction that the Howell County Fruit Growers' Association, if organized now, on a business basis, will, within three years, be known throughout this country and probably in Europe.

MISSOURI NURSERY.

The Largest in the World.

The largest nursery and orchard interest in the world, operated by any one establishment, is that of Stark Brothers at Louisiana, Mo.

This firm has in orchard and nursery at Louisiana and Rockport, Ill., hundreds of acres, and annually grow several millions of young trees.

The trade of the firm extends not only through the states, but to Canada, Germany, France, Italy, Hungary, New Zealand and Australia. The firm employs more than 1000 traveling salesmen, and a large number of people in its offices. They have orchards in 24 states, aggregating nearly 50,000 acres and 3,500,000 trees on the partnership plan. They are also interested in about the same number of trees under a co-operative arrangement. The packing houses are connected with the railroads by special tracks and car-loads of trees are shipped in every direction.

This nursery was started eighty years ago by Judge Stark. The business has descended from father to son and is now operated by the third generation, assisted by the fourth.

A MISSOURI FARMER AND STOCK FEEDER.

Hon. David Rankin of Tarkio, Mo., is probably the largest farmer and stock feeder in the world. He owns 22,000 acres of unsurpassed farming land located near Tarkio in one of the richest parts of the Missouri river valley. This land was selected with special reference to the crops Mr. Rankin wished to produce.

The management of the farm and stock is under a most perfect system. The land is divided into fourteen different ranches, varying in size from six hundred and forty to thirty-one hundred acres. Each ranch has an experienced foreman on a liberal salary. Then there is a superintendent who is in charge of all the ranches and looks after the farming, stock feeding, stock shipping, etc.

The foreman of each ranch is required to send to Mr. Rankin's office each month a full report of the men employed, the cattle, hogs, horses, farming implements, grain, etc., on hand and all changes, ship ments made and other matters of interest that would aid in the management of a business of such magnitude.

Mr. Rankin is the largest cattle feeder of his own products in the world. The number annually fed approximate 10,000 head and about the same number of hogs.

In addition to half million bushels of corn produced on his own land, besides other grain and pasturage, he is a purchaser of from 50,000 to 100,000 bushels of corn annually in order to carry on his extensive feeding operations.

His cattle are purchased in larged quantities in Texas, Colorado, Iowa and Missouri. One of the largest cattle deals probably ever made by a feeder was the purchase by Mr. Rankin of 8000 head at one time. To move these cattle required 300 cars, making twenty-five trains and a freight bill of $25,000. The cattle weighed seven million pounds, and cost, including freight, a quarter of a million dollars.

Mr. Rankin's success is largely due to the fact that he appreciated the value of rich land. In 1885, impressed with the fertility of Missouri soil, he moved to Atchison county, one of the most productive localities in the Missouri valley. Careful investigations confirmed his opinion of the value of this land and his continued purchases resulted in his present immense and profitable farm.

What Mr. Rankin has done indicates what others may do on Missouri land if their efforts are intelligently directed and if their calling is pursued with earnestness, energy and sagacity, and economy and good business methods are applied to every transaction.

SIXTH ANNUAL MEETING

OF THE

MISSOURI

STATE DAIRYMEN'S ASSOCIATION

HELD IN

Columbia, Mo., Jan. 13-15, 1896,

In Co-operation with State Board of Agriculture.

J. R. Rippey, Sec'y Missouri State Board of Agriculture, Columbia, Mo.:

DEAR SIR—Herewith I send you the report of the Sixth Annual Meeting of the Missouri State Dairymen's Association, held in Columbia, Mo., January 13–15, 1896.

Respectfully,

LEVI CHUBBUCK.

OFFICERS FOR 1896.

President—A. DOW.....Georgetown
First Vice-President—A. H. SHEPARD.....Columbia
Second Vice-President—G. B. LAMM.....Sedalia
Secretary and Treasurer—LEVI CHUBBUCK.....Kidder

PROCEEDINGS.

By invitation of the officers of the State University and Agricultural College the Sixth annual convention of the Missouri State Dairyman's Association was held in the Agricultural building, Columbia, Mo., January 13, 1896:

Association met at 2 p. m. House called to order by Vice-President Bruns.

ADDRESS OF WELCOME.

President Jesse—Mr. President, members of the State Dairy Association: I bid you welcome to the University of the State of Missouri. I bid you welcome in the name of the Board of Curators, who have heard with the greatest pleasure the announcement of this meeting. I bid you welcome in the name of the faculties of the various departments whose representative I am this evening. I shall not fatigue your patience with a multitude of statistics. My pocket is full of them, but no doubt they are better known to you than to me. I feel scarcely qualified to offer you instruction, for there is not a member of this Association at whose feet I might not sit and learn, nor is there a cow in Missouri that I could milk with her approval and the approval of the Dairy Association. But it is not expected that the President of a University should know the details of all the work in order to perform successfully his duties. It is his business, as I conceive it, to feel a keen interest in every line of work and to guide that interest with fair intelligence.

The dairy interest of the State seems to me a most important one. It gives to thousands of honest men and women a better occupation, in my opinion, than is afforded by many of the professions. It is moreover a source of great wealth to the State. Tens of millions of dollars are invested in it. The annual outcome is so large that if we could get it here for one single year we would never again bother the Legislature. It is of such importance that I cannot see how any intelligent man alive to the interests of Missouri can help feeling a profound interest in what her dairymen are doing.

I am much more interested myself, personally, in learning what our College of Agriculture and Mechanic Arts can do to aid the work in this State. We now have a building which, however small and inadequate it may be, is still vastly better than any we have ever had before; but I know also that this dairy, though better than any of its predecessors, is still not adequate nor what the dairymen of the State have a right to demand.

It is the purpose of the University to go before the 39th General Assembly and ask that provisions be made here for a suitable school of dairying. New York has lately given Cornell $50,000 for a dairy building alone, and it is so fine, that the Dean of the College, Professor Roberts, told me that visitors often asked if it were not the Art building. It stands on the campus, and is one of the most beautiful structures thereon.

Wisconsin has given her college $40,000 for a dairy building, and two years ago, with the Dean of the College, I visited every room in it. I can, therefore, testify to the excellence of its equipment and of its instruction. The milk bill alone is $100 a day. This plant is not run all the year around. They have in the winter months over 100 practical dairymen every year; some years a considerable number more. These men come for training in practical dairying. They do not want the science that underlies this work, but the results of science in practical applications. As we went over this building I resolved that if God gave me length of days, we would try to have such a school here. With cheaper lumber and other materials, we could put up for $30,000 a building as good as that of Wisconsin for $40,000 or that of Cornell for $50,000. If this State would give $30,000 for a building and its equipments we would have one of the best dairy schools in the United States.

Now, I want to ask you at the outset, for we want your support, if the Dairy Association will help the University when we ask for this building. We do not desire for an expression this afternoon if you do not choose to give it. But I repeat the question, when the University, goes before the 39th General Assembly, will the Dairy Association work heart and soul, for this proposition?

So far as I am concerned, I am willing that the Association should take the lead in the matter, or, if you prefer, we will take the lead, or, better still, we will join hands and together work to secure this much needed addition. If we combine our efforts we can get $30,000 for a dairy school here. I believe that your interests are large enough to demand this. Surely the taxes you pay on this industry make it but fair that a portion of the money be returned to you in order that here

in the College of Agriculture and Mechanic Arts suitable provisions may be made for giving better instruction in this work.

In closing, I rejoice that the University has within her scope the possibility of training young men and women for every useful occupation that can be carried on in Missouri. I am glad that the College of Agriculture is not in one part of the State, the Medical department in another, and the Law in another, but that all these stand together on one campus. If a State offers all these forms of instruction they should always be together on one campus. For my part, I believe, with all my heart, and all my mind, and all my soul, and all my strength in the teaching of the practical industries of life, and have no patience with the man who cannot recognize the necessity of teaching dairy work; nor have I, on the other hand, any patience with the man who is so engulfed in his own industry that he cannot allow fair range for classical instruction and does not believe in a philosophy that not only scrapes the sky, but goes beyond and pierces into the very sources of being, and into the very presence of God. I rejoice every day that here in Missouri we have on one campus agriculture, mechanic arts, engineering in all its range, law, medicine, pedagogy, and free permission to put on any other instruction that may be found useful to the people of the State. There is hope for a University where this is true. I am glad that our work is not split up and scattered in many places over this Commonwealth, but that it stands here in strong union on one campus.

I thank you for your attention.

Mr. Chubbuck—Allow me to suggest that in view of the absence of our president, Mr. Patterson, we call upon a gentleman present to respond to this address, one who is very intimately connected with the agriculture of Missouri, the founder of one of the leading agricultural papers of the State, for many years a member of the State Board of Agriculture, was president of the Mississippi Valley Dairy Association, and in other ways connected with the agricultural interests of the State for a long period of time, Hon. Norman J. Colman.

Mr. Colman—Mr. Chairman, Ladies and Gentlemen: I am placed in a very embarrassing position, being so unexpectedly called upon to respond to the address of welcome which has been made in such eloquent terms by President Jesse of the State University. I wish that every farmer in the State, yes, every politician in the State, every teacher in the State, could have heard that address. I know that it came from the heart, that it was sincere, earnest and philanthropic,

and I think many of those who have been casting slurs upon the State University and its officers would have changed their mind if they could have heard this address.

President Jesse seems to appreciate the importance of one of the most important industries in our State. He has alluded to other states where the dairy interests are more carefully cared for. To Cornell, for instance, a state that is in the far north where the stables, you may say, are locked up for six months of the year because in that cold climate dairying cannot be carried on successfully in the winter when butter commands its highest price. We are far more favored in the State of Missouri for carrying on the dairy business properly than in the more Northern states, and yet it is almost with a blush that I must say that this broad State of Missouri, the fifth state in the Union in the point of wealth and population, one of the best agricultural states, taking it in all respects to be found in the great galaxy of states does not produce enough butter and cheese to supply the wants of its own people. The citizens of this State are paying out weekly, certainly monthly, hundreds of thousands of dollars to the farmers of Iowa, Illinois, Wisconsin and the more Eastern states for an article which could just as well be raised here at home, and, in fact, better than in those states, and the money which is paid out to them be paid into the hands and pockets of our people. I think this is a serious reflection upon a state so well adapted to the carrying on of the dairy interests as successfully as they can be carried on anywhere.

It is true we have had a great deal of competition, not from the pure article of butter, but from a fraudulent article, oleomargarine. This put down the price by supplying the demands of the people, when a pure article would have served them better. There was last winter one of the most earnest fights on the fraudulent sale of a fraudulent compound that has ever been carried on in this State, and some of those present took part in the fight, and by a miracle succeeded in getting a law passed to prevent the sale of the article as butter. The Secretary of the State Dairy Association was present. He knows what trials and tribulations, what anxiety and fears were endured, and what efforts were made to carry the measure and the efforts that were made to defeat it. And if the enemy had not felt it was so strongly intrenched, so certain of defeating the measure, it would never have been possible at all.

That has come to our relief, and it will be a great advantage to the people of Missouri if they will take hold as they should and go to manufacturing butter and cheese.

President Jesse has stated that if this is intelligently carried on, it will give occupation to thousands of our sons and daughters. We have got to pay attention to the small industries, to the dairy interests, poultry interests, and these other interests, which summed up, amount to millions of dollars annually. We cannot succeed unless we carry on this work successfully and skillfully. In far off Sweden and Norway they are far ahead of us in teaching the dairyin g business. There they have schools for training teachers to travel from house to house, from town to town, imparting instruction how to make the best butter and cheese. When I was in Europe a few years ago, I went to the stores in London and Paris, in Sw eden, Norway and Denmark, and saw the butter that was put before the public in its most tempting forms. They are making millions of dollars because they have learned how to make butter through the instruction given by teachers who travel over the country imparting it.

The trouble is that we do not manufacture as good an article of butter as we should. Go into your country stores and see in what condition it is placed before the public. All kinds of colors, all kinds of tastes, some of it sweet, some not, some salted too much, some not enough, and in this way not one-third of a full price is obtained. Do you not think that we need instruction here?

I thank God that we have a president here who is in sympathy with the farming classes; who believes in this instruction; who thinks that a school of science and training should be used by the farming classes if they would get out of the mire in which they stand at the present time. You go to Illinois and Wisconsin, and when you strike a dairy country you find the best houses and farms; you strike an intelligent class of farmers; you will see that they have carriages, good horses and good houses. You will see that they are above the grade of those who simply raise their corn and send it in a raw state to the market. They feed out upon their own farms what they are raising upon them, and send off in a condensed form what they want to market, and their farms are kept strong and vigorous. They know the advantage of feeding out upon farms what is raised upon them. When I was abroad I saw that millions and millions of pounds of linseed and cotton seed meal were shipped abroad to Europe to enrich their lands and to produce their mutton. I visited Sir John B. Lawes, and in his pastures saw large tubs of linseed meal placed so that his steers could fatten upon it and enrich his pastures at the same time. He could double up in that way.

Dr. Jesse give this Dairy Association your support. You cannot confer a greater boon upon the people of this State than to educate

their sons and daughters to carry on the dairy business, build up their homes and farms and bank accounts, and you will do the very thing that is necessary to be done to establish a paying system of agriculture. Here you can teach in the Agricultural College the sciense of dairying, and you can send the young men and women home to impart this knowledge to others. You can teach them how to prepare for market butter and cheese. We are away behind in the manufacture of cheese, and it is a shame that we should be. You can teach them how to produce an article which will command three times what it does now.

I do not want you to consider that I slander the whole State. We are on the upward grade. We are making a better article than formerly. But the farmers do not prepare for it as they should by selecting the right kind of dairy cows, and the pastures have not been prepared with judgment, they do not supply shelter in the winter, nor in summer, so that the milking can be carried on without annoyance from the flies. Dark stables are provided in the north, the cows are milked in stalls, feeding, perhaps, during the milking time.

The creameries here are idle, for we have not got the cows, pastures, schools, all of which are necessary. But we hope to have this dairy school, and that it may be a medium of the greatest advantage to the farmers of Missouri.

I thank you all for your attention.

Secretary Rippey submitted the following report from the Dairy Commission:

The Thirty-eighth General Assembly passed a law regulating the manufacture, sale, keeping for sale, and transportation in this State of any substance designed to be used as a substitute for butter.

This law, with its enforcement charged to the State Board of Agriculture, went into effect June 20, 1895, and since that date violators have been prosecuted with as much promptness and energy as was possible under the circumstances. The Secretary of the Board was given charge of the work, and was authorized to use David May as agent at such times as might be deemed necessary, and Dr. Paul Schweitzer was named as chemist for the analysis of such suspected samples as might be collected. A circular letter was addressed to every prosecuting attorney in the State, calling his attention to legislation in the interest of pure butter and asking co-operation in enforcement.

A similar letter was addressed to judges of courts asking that the law be given in special charge to the grand juries, and that they be instructed to investigate violations in their respective localities.

Circulars calling attention to and interpreting the law were issued to the public, and dealers were notified that the Board would firmly and courageously demand a strict compliance with its every provision, and 2000 copies of the law were printed and distributed over the State.

Later it was found that one agent could not look after all the points in the State where violations were liable to occur, and after consultation with the Butter Dealers Association of St. Louis and upon their recommendation, Lewis Jehle was named as a local agent for that city.

Effort was made to secure cases under each provision of the law and if sustained in the courts we expected a compliance from all honorable dealers in the State.

Section 3886 of the Revised Statutes, regulating the manner in which imitation butter shall be served, has been the law of this State for several years, but no attempt has ever been made to enforce it.

Without this statute the present law would be of but little force as there is no provision which forbids hotels, boarding houses, restaurants or others from purchasing colored imitation compounds outside of the State, and serving it to their customers as genuine butter.

A case under this section was brought against a restaurant keeper in St. Louis, and the party in charge, C. A. Wickham, was arrested, charged with "serving imitation butter in vessels other than those provided by law."

The defense answerd that the law did not apply to restaurants, but only hotels and boarding houses, and further, that this restaurant was the property of a company, and that he, Wickham, was only an employe, and could not be proceded against under this section.

But on trial before Judge Murphy the validity of this statute and the position of the State was fully sustained and Mr. Wickham was fined $100 and costs.

After this suit was instituted a letter was received from Armour Packing Company, of Kansas City, asking for an interpretation of this section of the Revised Statutes as to how and what vessels should be marked. In answer the secretary advised that each individual dish in which imitation butter was served should be plainly marked with the word "oleomargarine." A letter of later date from this company states that "they desire a strict compliance with the law and have instructed their hotel patrons to use the individual dish with the word 'oleomargarine' written in plain letters on the inside of each dish."

All suits that have been instituted are for violation of the following provisions: Selling oleo as butter, selling oleo colored in imitation of

butter, and serving oleo in dishes other than those provided by the statutes.

Some of these cases, for reasons known to the court and prosecuting attorney, were dismissed at the cost of the defendant, probably on the understanding that the parties would abandon the oleo trade. In others judgment was rendered and execution stayed during good behavior of defendant, but in all cases that have been tried the validity of the law has been sustained.

To oppose the enforcement of this law the oleo dealers in St. Louis formed an organization and determined upon an aggressive policy.

In pursuance of their agreed plan on the 14th of October, a clerk of Mr. Kamman swore out a warrant for the arrest of Mr. Jehle, our local agent, charging him with an attempted seizure of butter without due process of law and with acting as a private detective without license or without written permission of the police commissioner.

The case was tried before Judge Murphy of the Court of Criminal Correction. S. S. Bass appeared for the oleo men and ex-Governor Johnson represented the Board.

Judge Murphy held that Mr. Jehle, the agent of the Board of Agriculture, had not represented himself as a private detective within the meaning of the statute, nor otherwise violated the law, and ordered his discharge.

As a result of the enactment and enforcement of this law but about 70 licenses have been issued by the Federal government this year in Missouri against 450 for 1894. All but 10 of these are in the cities of St. Louis and Kansas City.

Hofman Bros., commission merchants of St. Louis, say of the law: "Since its enactment and the appointment of a local agent for enforcement, the sale of pure butter has materily increased. We are able to sell large quantities now, while prior to the enactment of this law it was almost impossible to sell anything but fancy creamery."

W. A. Hudson, of the firm of Hudson Bros. of St. Louis, says: "We are pleased at the wonderful improvement in this market for butter the past six months. One year ago country roll was almost unsalable at 5 to 8 cents per pound and the same goods are now worth from 10 to 16 cents per pound and closely sold up.

"It has been a great boon to the small farmer chiefly. Also to the creamery. To show the necessity for this encouragement this house alone has sent out of the State for butter as high as $367,000 in one year, and it is estimated that this city sends out $2,000,000 annually for dairy supplies.

"We really believe the effect of the new oleo law will benefit the farmers of Missouri the first year of its operation over $100,000, and this benefit will increase, year by year, as the blighted dairy industry will revive, until the $2,000,000 sent out of this city will be paid to our own farmers."

Wm. N. Tivy, general commission merchant of St. Louis, says: "The law has been of great benefit. The representations made to the Governor and the Senate when this law was under consideration have been verified and fulfilled. The production of pure butter has increased in this State and found sale at fair prices. The purchases of butter from and the sending of large sums of money to Illinois, Wisconsin, Iowa, and other states must diminish, possibly cease."

Hassendeubel Bros. say: "The benefit and effect, so far, of the enforcement of the oleo law exceeded our expectations.

"If our legislators could spend an hour in some grocery store, in the tenement district, and see how these poor people were robbed by selling them oleo at 25 to 30 cents a pound as pure butter, they would not doubt the justness of this law. Yes, the benefits and effects are great. Continue to protect the farmer and the workingman."

W. A. Hudson, in a recent letter says: "Am informed by wholesale oleo dealers that one year ago St. Louis consumed 300,000 pounds of oleo per month while now less than 30,000 pounds are demanded."

"The results are wonderful. It has accomplished in six months what the Government law and others have been trying for years at great expense and utterly failed."

In the enforcement of this law in the cities we have not had the cordial support of the officers that you men from the country, who have been accustomed to deal with officials who were directly responsible to you, would expect.

We have had more difficulty in impressing them with the necessity of prompt action and in having the cases given proper and careful attention after being brought than should be expected. The law was a new one and had never been passed by the courts. No legal construction could be obtained from the Attorney-General, as he is not required to advise the State Board of Agriculture.

Under difficulties the Board has applied its energies to the enforcement of this law, and might claim at least reasonable success.

In all these prosecutions we have had the hearty co-operation and support of the butter dealers of the cities.

Neither their time, attention, nor financial aid was withheld where it could be advantageously used.

What success has been achieved and the good that has resulted to you men in advanced prices and better demand for your butter is largely due to their aid and counsel, and to the energy and determination they have thrown into the contest.

Neither should you forget the friends who "fought to a finish" the contest in the 38th General Assembly; nor the Governor, who, in the face of the powerful influence and combined capital and protests from manipulators of political affairs, had the courage to say, by signing the bill, that the farmers and dairymen of the State had rights that must be respected and interests that should be encouraged.

But while in the enactment of this law you have gained a signal victory, the fight is not ended nor is the enemy preparing to capitulate.

Your recent success was the result of your organization, and has called attention to your strength, to the justness of your cause, to the possibilities of the dairy industry if properly encouraged, has placed the oleo men on the defensive, and will rally to your support those who would suppress false pretenses, promote fair dealing and protect the public against fraud and deception.

But, with all this additional strength and with the advantage you have gained in the last 12 months, I beg to remind you that the oleo men command millions of money that may be used in an emergency; they are under the advice and counsel of the best legal talent in the United States; they are not lacking in courage and shrewdnes, and will not willingly surrender a profitable business.

You should be prepared for the contest when it comes. Strengthen your organization, lay in your supplies, marshal your forces, select your most discreet leaders, and, with vigilance and caution, prepare for the final submission and adjustment of this question.

The present law is but a step in the right direction. Out of it will eventually come more extended and better perfected provisions for the protection of the public against deceit and fraud. Consider now what you will then want and be prepared for the presentation of a statute that will protect your industry, guard the interests of the public and circumscribe the *legitimate* rights and privileges of none. The law regulating the sale of oleo should be so plain and positive that every dairyman, every hotel and restaurant keeper, and every oleo dealer in the State could understand it. The provisions should be so clearly stated as to admit of but one construction. The enforcement of a law thoroughly understood by the people, by the courts and attorneys, is relieved of many obstacles by the fact that it is positive and clearly intelligible.

A law subject to many interpretations, where the propositions are not clearly and concisely stated, where parts of several sections must be considered in order to ascertain a provision, is certain to result in confusion, and its vagueness to encourage violations.

Superfluous words, a useless repetition of synonyms, a blending together of several propositions, or entering at length into details, is likely to weaken the declaration, and may so thoroughly confuse the mind as to render any interpretation doubtful until, with able attorneys and an expenditure of large sums of money, it has been passed upon by the Supreme Court of the State.

The law should declare that all compounds made in semblance of, and designed to be used as a substitute for, butter, should be known as oleomargarine.

All trade-marks used with deceitful intent or for the purpose of concealing the fact that the compound is oleomargarine, should be forbidden.

Oleomargarine manufactured, sold or offered for sale in this State should not be colored or compounded so as to possess any shade of yellow that would resemble yellow, or any shade of genuine yellow butter.

No person should be permitted to sell, or offer for sale, any oleomargarine under the name of or pretense that it is butter.

No hotel, boarding house, restaurant, or other place where meals are served for a consideration, should be permitted to use oleomargarine colored or compounded so as to possess any shade of yellow that would resemble pure butter, and all vessels in which oleomargarine is served should be plainly marked in roman type with the word "oleomargarine."

An attempt to enumerate all the vegetable or animal fats or oils, or combinations of those articles that should not be colored, would be unnecessary, and, possibly, lead to confusion.

An attempt to name the coloring matter that shall not be used should be avoided for the same reasons.

The resources of the chemist are almost unlimited, and an attempted enumeration of the articles that may enter into the composition of oleo, and the naming of substances with which it shall not be colored, would be a hopeless task.

To declare that all compounds made in semblance of and designed to be used as a substitute for butter shall be known as oleomargarine, and that the oleomargarines manufactured, sold or served to guests for a consideration in this State shall not possess any shade of yellow that

would resemble pure butter, is plain and simple, and will require no expert to give an interpretation, and no chemist to make an analysis.

Before concluding, I would call your attention to the fact that these adulterations are not confined to dairy products alone, but enter largely into the composition of a great number of articles of food and textile fabrics placed on the market.

An enumeration of the articles thus manufactured and sold with fraudulent intent, would be a hopeless task. In dairy products not only butter but cheese, cream and milk have been subjects of adulteration, and much shrewdness and ingenuity have been exercised in placing them on the market as a genuine article, possessing a high order of merit.

Groceries are no exception to the rule, and the farmer who places his lard, apple vinegar, maple syrup, sorghum, or buckwheat flour upon the market does so in competition with cheap, adulterated compounds put up in fancy packages and sold under names indicating absolute purity, and at a price below which it is unprofitable to produce a pure and healthful article.

The use of shoddy in the manufacture of textile fabrics is one of the chief enemies to the wool interests, as it is possible to use a liberal admixture of this article with a little pure wool and produce an article that can be sold at a low price, yet imitates pure woolen goods so closely as to frequently deceive the retail merchant, defraud the consumer, reduce the price and decrease the demand for pure wool and thus materially injure the sheep industry.

There is no question as to the power of the States to protect their citizens against these questionable practices. A statute that seeks to suppress false pretenses and promote fair dealing does not abridge the rights or privileges of citizens of the United States, nor violate the regulations securing the freedom of commerce among the States.

The right of a State to protect its people from fraudulent practices, from being deceived into the purchase of an article they do not want, and that might prove both worthless and injurious; to enact laws that will promote honesty and integrity, and discourage fraud and crime, has never been surrendered to the general government, but is clearly reserved to the States.

Legislation in the interest of pure products and honest trade would seem to be one of the first and highest duties of a state to its citizens, and should be enacted without hesitancy or delay.

There is no trouble about drafting such a law, and it should be a plain, positive and courageous declaration by the legislators of this

State that the public has rights that must be respected and interests that cannot be outraged.

When asking legislation in the interest of pure an unadulterated articles, it should not be understood that the farmer or dairyman is demanding exclusive privileges or special favors. They only ask an open field and equal opportunities, and that they be relieved of an unjust competition forced upon them by the manufacture and sale of impure and deceitful articles.

W. N. Tivy, of St. Louis, discussed the paper in relation to the enforcement of the oleo law, gave a history of the law from its inception to date, and an interesting account of the desperate struggle necessary to secure its enactment. He told of the efforts on the part of the oleo men to induce the Governor to withhold his signature, of the victory finally won and the satisfactory results of enforcement.

If the law was to be continued on the statutes, then dairy men must look after their Senators and Representatives. Vigilance and energy in its most intense form would be required to successfully contend against the oleo men.

He spoke of the progress that was being made in legislation against oleo in other states and foreign countries, and the educational feature connected with the oleo law in Canada. Advised the promotion of dairy interest in connection with Agricultural College as indicated by President Jesse.

In conclusion said: "The benefit of this law has been considerable; 200,000 pounds more butter were sold this year in St. Louis than last and not one-tenth as much oleo. There is only one wholesale dealer in the city and fifty retail dealers where last year there were 400. Of course this law has benefited the makers of butter."

Dr. Schweitzer: I am aware that this is your meeting and that no outsider has any right to take part in your discussions; and yet I feel that there are points in connection with the law, so far as chemical analysis is concerned, that might interest you. I will not discuss its justice or wisdom, but simply hold that while a law it should be enforced. To bring this about I have done my best, and since Secretary Rippey has pointed out its defects in many respects, I will add to these. The law forbids the admixture of genuine butter to any substitute for butter as also the use of any article for the purpose of coloring either the oleo or the finished oleomargarine, commonly called butterine. And how do we find out whether the article at hand is butterine and whether it contains coloring matter added as such? By calling in the aid of chemical science. But there are a number of things that chemical science cannot do, at least not at present, and we

should be careful not to demand more than can be accomplished. As to a mixture of oleo and butter, a chemist sufficiently versed in these matters can undertake to tell with tolerable certainty whether oleo has been mixed with as low as 5 per cent of butter. Permit me to tell you the way we arrive at this fact. Butter-fat is not a so-called chemical compound, but a mixture of a number of such; not a single fat, but an aggregation of many. From some of these we are able to distill a certain per cent of volatile acids, which are closely related to the flavor of butter, while oleomargarine and the fats that enter at present into its composition are devoid of flavor and yield consequently no volatile acids. It is by this we distinguish the one from the other. Pure butter contains a much greater per cent of volatile acids than substitutes and this test will suffice as long as the raw material at present used in the manufacture of butterine, viz: oleo oil, lard, cotton-seed oil and perhaps some others is not increased by the addition of an oil that yields volatile acids. When that time arrives another test will have to be looked for; it undoubtedly will eventually be found; but it may take time, and thus you see the chemists' work is neither simple nor its results as open to inspection as would seem desirable.

The other point in the law forbids artificial coloration of butter substitutes. Now, this is a very difficult matter to decide. We have made in our laboratory some sixty or seventy analyses. We find butters not artificially colored that are yellow, and substitutes and oleo artificially colored that are not yellow; at least not as much as the former. It is necessary often to make quite a number of tests with single samples and to make them with a great deal of accuracy and carefulness, and to bring to it a considerable amount of personal experience.

If I were to put a gun into the hands of each of you, telling you to hit a bull's eye some 100 or 200 yards off, how many of you think you would succeed? Of course, you know it can be done, but it requires a great deal of personal experience, of judgment, of science, of practice and knowledge; and so it is with chemists. The personal shortcomings of such inefficient workers tend to confuse and invalidate the laws they are called upon to subserve, which renders it desirable and perhaps almost necessary in the enactment of such a law as the one under discussion, to have one section state in plain language the kind of and mode of applying the tests.

For example, I have given close attention for many years to the legislation of kerosene testing. Up to fifteen years ago you could hardly pick up a paper without seeing accounts of women or children having been burned to death by exploding lamps. Laws were made to

prevent this execution of the innocents. I myself had something to do with the passing of the Missouri law. I showed how a test could be applied in such a way as to make a bad oil appear good and a good oil appear bad and perhaps as a result a section now details the manipulation in applying the test.

Such a statement as to the mode of conducting the two tests which decide whether the oleomargarine contains butter or is artificially colored should form a section of the present law, and if you bring this about at the next meeting of the Legislature, an unskilled man may make the tests by simply following closely the directions.

If you were to ask me at this moment how this section should read I could answer and give you now what seems to me best. But I would say wait; for between now and next year the chemists in the employ of the oleo dealers and manufacturers will be very busy and it might be that their activity or discoveries would demand different tests altogether from those which are sufficient today. You say "we are practical men, not judges of such matters, and how can we know you tell the truth?" My reply would be the Agricultural College must be presumed by you to be officered by honest as well as able men. They are in such matters your natural advisers and none either would or would dare to go on record except on the basis of knowledge, of fairness, of honesty.

I myself do not think the law is a wise one, but in spite of this I have done my best to contribute to its enforcement. Secretary Rippey knows this. Connected with the Agricultural College, I claim the right to my opinion, which I hold honestly and on the basis of ample knowledge and experience. I concede to you the right to a different opinion; yet in spite of this difference I will serve you, should you call upon me next year, squarely and fairly. The law should be perfected, and when the time comes for you to go before the Legislature to bring this about I advise you to call upon the Agricultural College, the Board of Agriculture, or such body as you have confidence in, to furnish you with the points that to its better working should be incorporated in the law.

Mr. Lamm—I would like to ask a question. In passing this law we found that it was the very best that we could get through the Legislature. Did we not do a wise thing in getting it through just as it is when it was that or nothing?

Dr. Schweitzer—I do not know that I am able to answer. I know something of the discussions that took place. Will say that our legislators, in spite of all that is said against them, are willing to do the thing that they think is wise and for the best. I was before the

Legislature when the coal-oil bill was passed and was convinced that the only reason that certain changes were not made was because the men did not know what would be advantageous. I suppose there are very few of the members of the Association present here now who will know why it is necessary to incorporate the means of making the test in the law if they are convinced that the incorporation should be made. Then I think that a few words to the members of the Legislature would have been sufficient. If we take it for granted that the Legislature is dishonest then I pity the State. I think they want to act honestly and fairly toward the State and the one thing they need is actual and truthful information.

Mr. Chubbuck—I would like to say that there is nothing that succeeds like success. As Secretary of the State Board of Agriculture, I took a prominent part in calling into existence the State Dairy Association. We hoped that the State Board of Agriculture would farther that organization and bring about the state affairs that Dr. Schweitzer would have. But the child was a weakling and had not many friends. It had to go to work to do something. It went to the Legislature and made a fight. It may be an accident that we secured its passage, but I do not think it was quite so. I think it was due in part to the excessive hard labors of those who went there. We had in consultation the present Secretary of the Board of Agriculture, who is a friend of this law. He did not see the deficiencies as he sees them now. In other words, "hind sight is better than fore sight." It is not because we felt that we knew all about this or wanted to go ahead without the assistance of the State Board of Agriculture or the Agricultural College, and I think I can vouch for the Association that we are perfectly willing for the Board of Agriculture or the Agricultural College, if they are willing to do so, to secure the enactment of any law or laws looking to the agricultural interests of the State. I think that we will be willing to call in the assistance of the professor when the time comes to go before the next Legislature.

Mr. Davis—The Association needs the assistance of a large number of friends to help it to accomplish the purpose for which it was called into existence. The membership fee is $1. We have to depend on this to carry on the work of the Association. It is the only source of revenue we have, and we must appeal to the friends of this industry to help us to carry forward this work by becoming members of the Association.

Mr. May—Those who have not been in the fight have no idea what we have to fight. Mr. Tivy has given you some idea. If all members were as enthusiastic as he, it would not be so hard. This

law is benefiting Illinois and neighboring states that have no law on the subject, and we must have other states with us in this matter. Mr. Tivy has spared neither time nor money in aiding in the enforcement of this law.

Adjourned.

MONDAY EVENING, Jan. 13, 1896.

House called to order at 7:30, when the following paper was read:

WHY IS MISSOURI BEHIND OTHER STATES IN EXTENT OF DAIRYING?

A. Allen, Kidder, Mo.

Mr. President, Ladies and Gentlemen—In considering the subject assigned me, we will briefly state that it is not on account of any disadvantages of climate, water or feed that Missouri is behind in dairying, for we have all these in greater perfection than any other section famous for quantity and quality of its dairy products that we know of. From over 20 years experience in dairying in Northwest Missouri, having owned a two-thirds interest in the first cheese factory started in Caldwell county, and for six years being salesman for it, and afterward business manager of a creamery, we have been in a position to know that Missouri has superior advantages over the north and east for dairying, and our products have always found a fair market. Land is cheaper here than there. We can raise an abundance of the best of feeds cheaply here, and we can also raise a greater variety of feed stuffs here. Quantity, quality and variety of feed stuffs are the three important factors in the profits of dairying.

Feed, water and milk regularly at as near the same hours as possible, for with dairy cows an hour's difference in time of feeding and milking may change a small profit to a loss in these times of low prices. Feed liberally of good quality and variety. If you can raise enough on one acre to feed a dairy cow a year you are in luck, but don't starve the cow if you have to give her what grows on four or five acres. Remember that there are more dairies made unprofitable from under-feeding than from over-feeding.

Our observations are that the main reason that Missouri is behind other states in dairying is that her people are hard to get out of the old ruts that they got into before there was a railroad through nearly every county. In those days they made most of their money by feeding cattle and hogs, as these could be driven a long distance to market.

There is still some profit in feeding cattle and hogs for market. Now let us compare the value of 100 bushels of corn or its equivalent in other feeds of variety for dairy cows, fed whole, and hogs to follow both steers and cows so as to be fair on both sides, the cows to be average cows and fresh. The 100 bushels of corn fed to steers would make about 400 pounds of gain at five cents per pound, would be $20, besides what the hogs gained.

Fed to cows, it would make 200 pounds of butter, which at 25 cents per pound would be $50, or 600 pounds of cheese at 10 cents per pound would be $60, and if the skim milk or whey were fed the hogs following the cows we would have at least one fourth more gain on the hogs than on those following steers—no small item in favor of the cows.

Another reason is that too many men in Missouri think it too small business for them to milk cows, although they give a regular monthly income in cash to pay running expenses with. Feeding three or four loads of steers on money obtained from the bank at a high rate of interest looks big to start with, but those that have finished their cattle and put them on the market during the past two months cannot see anything very big about it, only a big deficiency and nothing to pay it with.

We lay no claims to being a prophet, but will venture the prediction that in the near future Missouri will rank near the front in dairying, both in quantity and quality of dairy products. Take the sections of the State where dairying has been carried on for a number of years, you will find an intelligent and prosperous community.

The farms are better improved, crops are fed out at home, thus improving the farms instead of having them grow poorer every year as in the case where the grain and hay are sold.

Another point we have observed is that in a dairy community where they have learned how to feed dairy cows they have also learned how to feed steers to a better advantage, and perhaps there are not quite so many steers fed as there were 10 years ago, but there are more pounds of beef made now from the same amount of feed and of better quality and brings in more money than it did then.

We suppose you will ask what kind of a dairy we keep and what we make from a cow per year? Our dairy herd is composed of pure bred Shorthorns, and high grades mostly; our market is the cheese factory; our income averages about $35 per cow per annum, besides what milk is needed to raise calves. We are selling milk to pay the running expenses of the farm and raising the calves to pay the mortgage.

Now friends, there are thousands of cows in Missouri this winter that are just beating their owners out of all the feed they are consuming, and will weigh less in the spring than they did last fall. All the feed and care bestowed on them is worse than lost. Now, just here, is where dairying comes to the rescue. If you are in reach of a creamery, cheese factory or milk shipping station, and if you are not in reach of either of these markets combine with your neighbors and secure one of them for a milk market, and after you have secured a market for your milk, make your cows pay for their feed or leave the premises.

Mr. Chubbuck—This subject is a very important one, it seems to me, for the members of this Association. It is a question I have been asking for a number of years and I have not yet had it answered to the satisfaction of the people of the State. I believe we can spend a little time in discussing this question profitably. We have Iowa north of us with 800 and Kansas west with 150 successful creameries in operation; how many in Illinois I do not know, probably 300. In Missouri we have less than 50, probably not over 25 in successful operation today.* We have had started in the State possibly 150 creameries, the most of which are in the condition of the one here at Columbia, idle, or worse than that, disposed of for some other purpose. Why is this? Why cannot we start creameries in this State and make them successful? As stated in the paper, we have the climate and soil. Let us discuss this question.

Chairman—A good suggestion; let us make the best of it.

Dr. Schweitzer—I do not presume to make any remarks to this Association on the paper which has just been read, but there are two points which have come out which I take the liberty to make a few remarks on. The claim is made that Missouri can be made a dairy State. What does it mean to make Missouri a dairy State? We can find out by comparison. Some statements were made this afternoon about Denmark being a dairy state. Denmark is about one-sixth the area of Missouri, and has about the same number of inhabitants. This country, perhaps with Switzerland, are the two countries that may really be called dairy states. The production of butter in Denmark was a few years ago 170,000,000 pounds; of this 100,000,000 were exported, 70,000,000 being consumed at home. That is to say, the consumption was about 55 pounds per head annually. I have no statistics as to the consumption in this country; it is not less. There is a

* Information collected to date puts the number of creameries, 86; cheese factories, 21.—Secretary Board Agriculture.

little state, one-sixth the area of Missouri, that exports 100,000,000 pounds. Ninety millions are exported to England; 25 cents per pound is paid for the product, which makes $25,000,000. Of course the freight has to be paid out of this. I presume, however, it is not very great. We do not export, but import. We do not make enough for our own consumption. It seems to me if we want to become a dairy State we must look toward the exportation of butter. Even if we want to I hardly feel like calling Missouri a dairy State. Now, then, as to the difference. It is not quite a year ago since I made in a body of farmers the statement that Missouri was a dairy State. The Governor was present, and in his shrewd way he asked me afterwards if Missouri was indeed a dairy State. I thought probably that I had made a statement that was unwarrantable. I corresponded then with persons who were presumed to know. Mr. Monrad was one of them. Mr. Monrad is the editor of a dairy paper. The statement that I had made was that I thought the northern half of Missouri could be made a dairy country. I asked these gentlemen to tell me whether I was correct in making that statement. They wrote me that I was correct. That means this, that the southern part of the State cannot be made a dairy country. My experience is that every three or four years we have a dry spell in July or August that dries up the grass, and it is a question whether or not we can carry on the dairy business as it is in Denmark with a climate somewhat tempered by the Gulf stream and with rains in greater quantity than we have. If we carry on the dairy industry as it is carried on there we are bound to fail. We can make it profitable if the season happens to be favorable, if unfavorable, it will be a failure. There have been quite a number of failures all over the State. We had a dairy house erected here about one and a half miles from Columbia that is a failure, for the reason that the farmers could not be induced to furnish a sufficient amount of milk. If we want to make dairying a profitable investment we must change our mode of agriculture and even the cows. Since we have these periodical failures here there must be provisions for feed. It is not necessary to state that by proper agriculture we can raise a good deal more than by natural means. Corn seems to be the most natural crop to grow. By planting it closely one can have something that can be used when the grass dies out by drouth. There is no use in trying to induce farmers to go into the dairy business in the southern portion of the State, for as soon as one of the dry years come that dairy will fail. I am interested in having this State become more of a dairy State than it is, but we must be sure that should we have a dry season there will be no trouble in getting feed for the cows. We must export butter; 100,000,000

pounds must be exported. Dairying here must stand upon a different footing from the dairying that is carried on in Denmark and Switzerland, and until this is done there will be something lacking in putting force to the wish to make this a great dairy State.

Member—There are more views than one on this question. Butter is a thing that the people like if they have been educated to know what good butter is. We have been cited to the Northern states. You look at the population of these states; they come from butter producing countries. They came there and saw the necessity of producing good butter. The people who came here and started creameries had a taste for good butter also, but the fact of the case is the people did not know how good butter tastes. Now, it is evident that if the boys and girls are educated to use good butter, by the next generation this will be a great dairy State. We do not need to export a single pound of butter—we need it here at home. We want to make this State a dairy State, not because we want to export it, but we want it here at home.

Mr. Chubbuck—There is a gentleman in the house who can speak feelingly on this subject. One who has had experience in dairying in South Missouri, where, as he once said, one could stand on the tops of the hills and tickle the angels' feet. Please call upon Mr. Rice.

Mr. Rice—Ladies and Gentlemen: I fear that my friend Mr. Chubbuck has mis-stated my case. He said I was familiar with the dairy in Southern Missouri, when the truth is I am familiar with a dairy failure in Southern Missouri. We tried it, and failed. We had everything that the good Lord had done for the great State of Missouri—good running water, blue clouds, magnificent scenery—but it seemed to me that every dairyman wanted his wife to milk the cows. I only had one wife and I had six cows, and one wife couldn't milk them all. And my neighbors were in the same fix. We bought $6000 worth of experience from Davis in creamery equipment. We had more creamery than milk; and although we could stand on the summit of those mountains and tickle the feet of the angels in heaven we couldn't run a dairy.

In traveling over Missouri representing my company who are in the transportation business, I have taken a decided interest in the practical side of dairying. Out of 120 creameries representing $420,000 there were only 70 of them running two years ago. I understand that there is $500,000 dead capital belonging to the farmers represented in these creameries. I attribute it to the fact that we are too hasty in starting enterprises that the people are not familiar with. The result is failure. But the dairy interests in Missouri will only be carried

on successfully as in Wisconsin, Iowa and Illinois when the people take deep interest in pure food. We want a pure food commissioner. The University should take some steps to provide this commissioner for us. We need some head or authority to protect our interests when we go to a new community with a desire to develop our industry. But how are we to obtain this? The Board of Agriculture is, of course, doing a great deal for us. They are interested in us, and we are always very anxious to have this Board meet with us. But there should be a deeper and more abiding interest in putting these questions before the farmers, so that they can understand it and carry it on as it is other states.

Mr. Chubbuck—One county in this State is represented by five or six men in this audience, representing almost as many creameries, and in that immediate part of the State there are other counties having considerable dairy interests, which show that that section of the State has facilities for dairying. I would suggest that you call upon Mr. Lamm, of Sedalia, to tell us something of dairying in his county.

Mr. Lamm—Mr. Chairman, Ladies and Gentlemen: I think that I am hardly the proper one to present these matters to you; I think it would be better if some of those from Lafayette county should take this matter up. I do not know that we have any advantages that are not possessed by the other portions of the State. I understand that in those portions of the State where the German people live, who are willing to get right down to work and stay with it, they find dairying as profitable as anything else. They like it and are contented with it. I do not see that our portion of Missouri has any advantages over other portions of the State, unless it be the Southern portion. I think that we are on the right track. I believe the outlook is growing brighter. I believe that we are improving in dairying. I remember that when Mr. Bruns came over to Sedalia he did not have as nice butter as he has to-day. As I said I think the pathway is growing brighter. I believe that with the assistance of the Dairy Association, the Board of Agriculture, just legislation, and especially if we take an interest ourselves, the dairy industry of Missouri is bound to grow. When we once learn what good butter is we will never be content without it. We have the means to produce it if we have the disposition, and I believe the disposition is a matter of culture. I believe the way to get an interest in this is to study the subject, and when we take an interest in it and find out what it will do for us we will become more and more of a dairy State.

I think that Mr. Bruns and the Lafayette county creameries are satisfied with the results. We have not had quite such good success

in our county, but I think we have reached the bottom and are now going up. In many respects we have overcome difficulties that were in our way, and from now on I believe that dairying will become a more permanent occupation with the people. There is nothing disagreeable about dairying. I believe when the people try it they will like it better.

Chairman—I am from Lafayette county. We are mostly Germans and are used to work, and are not afraid of it or ashamed to milk. I find that the principal difficulty is that we do not get the right kind of cows. We have been grading up with beef animals. There has been more money made out of the beef kind than anything else. We all love the Shorthorn. We can eat them after we get through milking them. But if you look at it from a practical standpoint I think you will find it as an old gentleman from St. Louis said, that the beef side was not to be considered; that you could get a good Jersey cow and she would make you from ten to twenty-five dollars more in butter than the beef cow, and that after you had kept her five or six years you need not think of eating her, but could afford to give her honorable burial.

In our neighborhood we take turn about in hauling the milk. Our creamery is run on the co-operative plan and I think it a good one. We are well pleased with it. Many are going into the business. I was talked into this business by Mr. Erwin at a Farmers' Institute. He said "examine yourself and see whether you are fit for a milk man, and learn as you grow in the business." I have tried it and am better satisfied with it than any other branch of farming.

Mr. Chubbuck—We have heard from a farmer, a newspaper man and a chemist on this question. I would suggest now that we hear from Mr. Tivy, a dealer, on the subject.

Mr. Tivy: I have had the job of starting a creamery under difficulties. I can't agree with my friend, the professor, that Missouri is not a dairy State. Up in the Elgin district they have no better land than we have in Missouri, but they are making better butter. They prepare for it better; they feed better; they have their barns in better shape. We started a creamery up at Dwight, Ill., and found that one of the difficulties was that there were not enough cows to supply the creamery. We persevered in it nevertheless. We got a man at the head of one route who knew what he was about. Then we got a great deal of milk and the creamery was a success.

One man had 60 cows. We first arranged to buy his butter, but later on succeeded in buying his milk.

The creamery is a benefit to this community, and was run there afterwards at a profit every year. That whole German settlement was made up by it. The opposite settlement followed suit, and today they are supplying milk to the Chicago market.

Now take the Elgin district. They bring in tons and tons of bran every year, and they weed out their poor cows. They have drouths just the same as we do, but they prepare for it; they have silos; they try to furnish green stuff as much as possible. If the grass fails they bring in this feed, and they feed heavily there. I think one trouble in Missouri has been that creameries have been started where there was not enough cows to supply the milk.

The Holsteins give poor milk compared to the Jerseys or Durhams. Jersey and Durham mixed makes a good cow. In the Elgin district they have certain requirments in buying the milk, a test is made of the quantity of butter contained in it and they pay for milk according to its quality; in Missouri they pay for the quantity of milk.

I tell you there is as good butter made in the State of Missouri today as in any state in the Union, and some of it is selling as high in St. Louis as the Elgin butter.

Southern Illinois makes fine butter, and Missouri makes some fine butter. We do not need to export our butter from this State. St. Louis buys 15,000,000 pounds, imports it.

My experience is that a creamery started in a place where the people are not afraid to work, will succeed. And if they object to milking they can use machines. They have them now I believe that will milk 10 cows in 20 minutes, or two minutes to the cow. Parties that are using them claim that they are successful. Creamerymen should instruct their patrons how to milk if the instruction is needed. When the people learn how and are not afraid of work, this will be essentially a dairy State, and the benefits will be more than many think.

In dairy communities the roads are in better order, the pastures are improved, the horses must be in good condition, the wagons and harness must be in proper shape. It makes him quicker and better return in cash than any other branch of agriculture.

Mr. Colman—You spoke of raising the calves on skimmed milk, do you think that can be done successfully?

Mr. Tivy—Skimmed milk, with the addition of a little flaxseed jelly will raise you just as good a calf as if you had given it the whole milk.

There are no cheese factories in Missouri. It would seem to me that in some portions of the State cheese factories might be successfully run. (There are 21 in operation in the State.—Secretary Board of Agriculture).

DAIRYING COMPARED WITH BEEF AND PORK PRODUCTION.

By Col. M. B. W. Harmon.

Gentlemen—The subject of dairying as compared with beef and pork production is one that the blue-grass and clover portions of Missouri are financially and deeply interested in. With such foods as are avaliable on most Missouri farms, the production of butter alone costs close to 4 cents per pound, beef close to 8 cents per pound and pork 2 cents per pound, each varying with the amount of grain used at its prices. First-class butter sells at about 15 cents per pound, beef 4 cents per pound and pork 3½ cents per pound. But Missouri farmers have tried the production of each separately, and while there is usually a profit on each as a separate business, they find the most profit in dairying and producing beef and pork in connection with the dairy. To sell milk off the farm is dairying alone, and for this reason the co-operative creamery has not been as successful as their promoters promise and numerous private dairies are taking their place. The cows and heifers are bred on the place and those not intended for use in the dairy are steered and fattened for the butcher. Each cow can raise a calf and an average of two pigs, which are finished in the feed lots and thus the milk is made to do double duty. The butter is taken from the milk and the milk is fed to calves and pigs in connection with other feeds at a profit all around, for it is generally believed that pigs fed or partly fed on milk seldom have disease of any kind. An average of 10 Shorthorn cows of fine milking strains as Belinas, Princess Gwynne, Princess Gentles, etc., to the hand, with 10 calves, or one each to the cow, and 10 feeders with two pigs each to the cow, is something near the profitable production that can be carried on on most Missouri farms. This combination of dairying, beef and pork production was formerly impossible for want of proper markets, but now the summer packer pays as much for hogs and cattle as the winter packer, and the railroads will carry from a small package to a car lot and deliver in a short time to any market that you wish to sell in. Admitting that this combination is most profitable, it must also be admitted that the market is almost without limit, especially a good article of butter. To promote the gospel of good butter, good beef and good pork is, I believe, the special province of the Missiouri Dairyman's Association and is well worthy of the best efforts of every true Missourian.

Ques.: What food does he use in producing his butter?

Ans.: We are using corn-meal—some hay.

SCORING BUTTER.

By G. H. Rabius, Mayview, Mo.

Mr. Chairman—The subject assigned me is a difficult one and I hardly know whether or not I shall be able to handle it satisfactorily.

There are many opinions in regard to scoring butter but I shall only attempt to give my own opinion and some of my limited experience about this matter. In the first place we are all inclined to think that our butter is superior in quality to that of others and yet there is a vast difference in price when placed upon the market.

The scale, or number of points upon which butter is graded is not so important as the method upon which the grading is conducted. Very frequently we hear the complaint that the judges were selected to score a package in favor of some one and were partial in their decision. I do not believe that with rare exceptions any one instrusted with such an important duty as the scoring of a large exhibit of butter will do anything of the kind. Every one of the exhibitors is expecting to receive a true score of his product. It is not the premium for which we should exhibit, but the vast amount of education that can be obtained from scoring. There is no better place for a butter maker to find out the fault of his goods than at the exhibit, and it should be the object of every one interested to get the best judges that could be obtained and let them closely criticise and make a report on each package. Before scoring, the packages should be arranged in a row upon a table. All should be covered with a cloth, the edges of which should be fastened down on all sides; then cut a hole in the center of each package through which to pass the trier. In this way every package can be sampled and the judges have no knowledge as to the ownership or the manufacturer. Every judge should draw his own trier, as a great portion of the delicate aroma will be disipated by carrying it any distance in the open air, and in drawing his own trier he has a better opportunity to see how the butter was handled and packed.

The coloring of butter for the different markets should have careful consideration. All who have made butter for the general commission trade know, that different cities require different shades of color. Judges from one place are likely to score on color to suit their trade, while many of the exhibitors may be the patrons of other markets. In that event it is unjust to score the butter off on color when for the market intended it would be all right. My opinion is that each package in an exhibition should be labeled with the market for which it

was intended, and the judges select proper shades for the different markets and score accordingly.

Now, let us go back to the scale upon which butter is generally scored. I am somewhat inclined to believe with Mr. Graham, and advise scoring each point on the scale of 100. It would undoubtedly avoid ties. I do not think that the texture is equal to flavor or even color, and color ought not to be upon the same basis as flavor. Very often I have seen two packages of butter sell for the same money, one with less flavor but perfect in color. These two points are a matter of taste and sight, and we all differ in regard to them. One person will eat the butter because the color suits him regardless of the nutty flavor so much admired by another. Others consider salt one of the most important ingredients of good butter, and its effect upon flavor is certainly great. Butter lacking in flavor is very much improved by a larger quantity of salt.

I see no reason why the same rules that are used in scoring butter would not do equally as well with cheese, but not being a cheese maker, I am not prepared to say in regard to that, but should like to hear some opinion upon this matter.

In conclusion, I would score on a scale of 100 points, making flavor 45, color 30, texture 10, salt 10, package 5. But whatever may be the rules and regulations that govern the scoring, it should above all things be just and fair and without prejudice.

Gov. Colman addressed the Convention, and strongly defended Missouri against the charge that had been made that it was not a dairy state. He claimed that Missouri had a climate admirably adapted to dairying, that the mild winter permitted winter dairying; that cows and all domestic animals were very healthy here; that we had good water, unequaled pasturage and an abundance of cheap stock food. We were behind other states in dairying because our people had not given as much attention to it as to other lines of farming; had not bred and developed a good class of dairy cows; did not handle them with as much skill, and we have not yet learned how to make as good butter as is made in some other states. But with the same care and skill, he said, there is no state in the Union that can surpass Missouri in quality and quantity of dairy products.

Wm. Tivy—One reason why they beat us in Illinois at dairying is because they get the best cows. North Missouri furnished the Elgin district with five car-loads of cows, which were bought by an expert. They have expert cow-buyers out constantly looking for cows. If they happen to get a poor one, she goes to the butcher.

Mr. Smith—There may be various opinions as to why Missouri is not a successful dairy State. We all have our ideas. I think one of them is simply ignorance. I do not mean that our people have not as much sense as people of other states, but ignorance along the lines of dairying. They do not understand the kind of cow to keep, and if they had the proper cow they do not understand how to feed her, take care of her and milk her. They want somebody else to do the milking, and they do not understand caring for the milk after they have it, nor how to make the best butter and get the best prices for it, and they are of such a disposition that they do not want to learn. I find the prevailing idea among the people is that they know all about it, especially the old ladies, and it is a hard matter to tell them anything. When they make butter and send it to the market, they must leave themselves open to conviction. If they find their butter lacks in flavor or grain, they should be of such a disposition that they could be convinced that they were not making the proper thing for the market. They must find out what the requirements the market are; and if their butter needs a little more salt or more color, why add it. Now to illustrate: At a Farmers' Institute last fall there were 33 kinds of butter exhibited and I do not think any of them were perfect. I knew that none of them were sold in any of the leading markets. I think that our people need education along these lines. They need to cooperate, and find out what they do need.

As to keeping the proper dairy cow, I find this disposition among the people: They want to make their neighbors beleive that their cow is profitable so that they can sell her for a little more than they could get from a butcher (I am a farmer and I can talk as I please to farmers and they must not get mad). I run a dairy and do general farming too, and often I have men come to me and say they have a good cow to sell, and that she is just the cow I need; she gives large quantities of milk with which to supply my customers. I tell them that she is not the cow I want. I want a cow that gives plenty of milk, and rich milk, and if she comes up to the standard I would like to have the cow at a reasonable price.

I just want to speak of one thing that I know to my positive knowledge. I know a locality where they got good butter, although it came from the farmers, and it was thought that a creamery should do well in that locality. A creamery was started and the butter shipped to the market. They did not expect to get very good butter the first time, but the butter was shipped the first of the week and on Friday it was sold. Saturday the returns were received. The next butter was sold at the high quotation of 21 cents per pound, and these farm-

ers had been getting 8 or 9 cents at the stores for their butter made with the same kind of cream that brought 21 cents on the Chicago market. Allowing that it takes a reasonable price from the butter for collecting, a creamery, if it is run as it should be, should make and collect for 5 or 6 cents per pound. Farmers must co-operate. If the trade demands a certain grade of butter, they must furnish it. The butter must be uniform. There is a sale for it if it is up to the standard.

Mr. Chubbuck—The question has been thoroughly discussed. It is evident to my mind that the prevailing opinion is that our backward position as a dairy State is due to ignorance and lack of skill. I believe that is the reason, we are deficient in skill as dairymen. And I hope the President of the State University, the Dean of the Agricultural College and members of the Board of Agriculture who are present will have this fact deeply impressed upon their minds, that the farmers of Missouri are deficient in skill as dairymen, a business which, if conducted with skill, is profitable, and that they will put forth their energy, particularly through the Farmers' Institutes, to develop this skill. The State Board of Agriculture is in session now, and that body has this work in hand. You remember that one of our members said he was led into this work through a talk made at a Farmers' Institute; so I say, in view of the fact that the Board of Agriculture is in session now that we convey to them our hope that this industry will be carefully nurtured by the Board, and that the College of Agriculture assist the Board in developing this business of dairying.

On motion, the convention adjourned to meet at 9:30 Tuesday morning.

TUESDAY MORNING, Jan. 14, 1896.

House called to order by Chairman.

THE FARM DAIRY.

HOW TO MAKE IT PAY.

The following paper was read by A. H. Shepard, proprietor of the Eagle Park Dairy, Columbia, Mo.:

Our esteemed Secretary has done a generous act in assigning to me the above subject. If I possessed the aggregate knowledge and the aggregate experience of all the members of this Association and wished to communicate it to my fellows, I would choose no bigger title for that communication than "The farm dairy, and how to make

it pay." But as the knowedge possessed is but as a drop in the bucket, and as my experience is limited to sixteen years, you will approve me for only attempting to treat the subject in a very brief and partial way.

MOST IMPORTANT FACTOR.

There are two prime factors upon which success in dairy farming depends. First of these is the farmer himself; second, outside circumstances or conditions. Referring to the first factor, let me mention a little conversation with Dr. Laws that occurred about ten years ago. It was soon after I moved to Boone county, and the first time I had met the doctor since being a student some six years before. He gave me a friendly greeting and inquired what I was doing. I told him that after leaving the agricultural school I engaged in dairy farming in Saline county; had been fairly successful, but being unable to own a farm in that fertile region, I had lately come to Boone, purchased a farm on Hinkson hills, and was about to try my fortune on soil less fertile. Said he, with much force, "It don't make a bit of difference what kind of a farm you have; it all depends on the farmer." This was Dr. Laws' emphatic way of saying that the most important requirement to successful farming is the farmer himself; and the ex-president was right. Especially the man who embarks in dairy farming in this day of active competition should have adaptation and knowledge of the business. He should have plain common sense, patience and industry, and a spirit of inquiry and close observation. If, in addition, there is a love for the farm and a fondness for cows, all the better. Assuming, however, that our dairyman is all right, let us proceed to consider the other factors—the farm, the barn, the herd, methods of management, etc.

SELECTION OF THE FARM.

The farm must be selected with much care, and with a knowledge of the requirements of the business. The nature of the soil should be quick and fairly fertile, though extra rich soil is not to be preferred. It should possess good, natural drainage, have sufficient shade well distributed over the pastures, and good, pure spring water, or wind pump. The soil should be adapted to the growth of blue grass, clover and timothy, wheat, oats, rye, corn and sorghum, as all of these are important items in the bovine bill of fare. The size of the farm may properly be determined by the price of land; and the method of farming must, of course, be more intensive where land is high-priced. Where land is not too valuable, pasture grass should be the main reliance for about six months of the year; yet a field of corn or sorghum should be provided each year to meet the possibility or probability of

a drouth in August or September. Where land is valuable, a larger number of cows can be kept on a given acreage by a system of continuous feeding throughout the year. Whether land is high or low, whether the pasture or soiling system is pursued, a good, well-planned, well-constructed barn is indispensable, and in its planning and arrangement the dairyman has ample opportunity to exercise his plain common sense. There are, perhaps, as many different plans for barns as there are men who have thought upon the subject. The large, three-story barn, designed for the entire stock of horses and cattle, the hay and grain, and the storage of manure, is open to serious objections.

THE DAIRY BARN.

The barn should be constructed with a view of affording safety, comfort and cleanliness to the herd, economy of labor to the herdsman and ample storage capacity for the provender. In order that it may serve all of these purposes, I would build the barn in two departments —a cow-house and a feed barn, placing them about two rods apart, and connecting them by an inclosed gang-way. I would have the cow-house rectangular in shape, with walls of brick, floor of cement and roof of tin or iron, with only enough wood-work inside to fasten the cows, and with windows to make it as light as a school-room. It should be open from floor to roof, and if it is to accommodate a large herd in stalls, there should be windows in the roof to admit sunlight direct to all parts. About 60 square feet of floor space should be allowed to each cow, and as authorities agree that 1000 cubic feet of air space is required per cow, the average height from floor to roof should be about 16 feet. Suppose the barn is intended for 40 cows, the dimensions then would be length 80 feet, width 32 feet. Let a five-foot passway divide it crosswise through the middle; then allowing 3 feet 9 inches per cow there would be just room for 20 cows on each side of the passway, standing with heads over feed floor parallel with long side of barn. Between the rows of cows is a driveway for the manure spreader which enters at one end and goes out at the other, taking the manure directly to the field each day. From the center passway a fire-proof door opens into the covered gangway that connects the cow-house with the feed barn. The feed-barn is simply a storage building for the hay, grain and other feed for the herd, and may be constructed on a less expensive plan, the object being to preserve the feed where it can be easily conveyed on hand truck to the cow-house. If a silo is used it may properly be in the feed-barn as may also cutting-box and mill for grinding.

ADVANTAGES CLAIMED.

Some of the advantages claimed for the above plan of barn are: First, the cow department being about fire-proof, the herd is secure from danger by fire. This is no small matter when we consider the frequency of fires, and that to the owner who has spent a good part of his life building a herd to his liking, the cows have a value far beyond their selling price. The cow-house is light and airy and easily kept clean, thus conducing to the health and comfort of the stock, while the feed, being in a separate apartment, cannot be contaminated by odors or breath from the cows; and it is quite as convenient to convey the feed 30 feet from feed-barn to cow-house on a level floor as to mount into a loft and pitch it down a chute.

SELECTING THE COWS.

Next let us notice the occupants of the barn, the cows themselves upon which more than any other condition the profit of the business depends. The money made in dairying is all made from good cows. Hence the importance of carefully selecting the foundation animals, and of judicious breeding ever afterward. There are certain characteristics that distinguish the milk cow, yet, perhaps, no two judges would agree in defining these characteristics. In selecting a cow, first of all see that she has good constitution, lustre of hair and brightness of eye. See that she has a large and vigorous stomach and bowels, broad hips and lumbar region. Then see that she has a decidedly lactificial temperament. This will be indicated by development of udder and milk veins, and by feminine appearance. Do not be influenced too much by pedigree, but remember that a record is better than a pedigree, and the best part of a record is the integrity of the man who made it.

MANAGEMENT OF THE HERD.

The prime object, of course, is the production of pure, clean, healthy milk in the most profitable way. Let the cows come fresh in the fall; they then get the benefit of September and October grass, and go on winter feed in full flow of milk, which by good care and generous feeding, can be maintained throughout the winter, and the succulent grass of spring will continue the flow in good quantity up till the hot weather of June, at which time they should be allowed to diminish in milk and be forced to go dry seven or eight weeks before calving next time. I know dairymen do not generally advocate so long a period of rest, but experience has convinced me that eight weeks is

none too long, and that to continue milking up to time of calving, is injurious and dangerous to cow and calf alike. Furthermore, the milk from cows so near calving is unfit for human food. Also, where infants are fed on cow's milk, I have cause to believe it should never be taken from pregnant cows. It seems a law of nature that lactation should cease as gestation advances. Much has been written about feeding dairy cows. Fortunately, the life of an average dairyman is too short to read it all. My rule can be written on a single line; it is this, give a

GENEROUS SUPPLY OF GOOD FOOD.

Cows differ in their capacity and requirements; so it is necessary for the herdsman to study their individuality, and feed accordingly. In this locality clover and timothy hay, corn fodder, ground corn, oats and bran may well form the staple feed for winter. The relative proportion of corn should vary with the season and the temperature. It will be found that when the cow's ration contains a large portion of corn the flow of milk will be affected but little by a sudden cold wave. A practical plan is to put the cows in barn at 4 p. m. Give a feed of bran and corn chop, equal parts. An hour later give clover hay, then in the morning repeat the grain feed, and if the weather is not very cold or stormy turn the cows out for water and exercise and scatter a feed of corn fodder for them on parts of farm that need enriching. The mode of feeding must also vary with locality, relative prices of different feed stuffs and other circumstances. Hence, the judgment and good sense of the dairyman should always be active in adapting methods to constantly varying conditions, and in seeking for improvement in methods, science is the guiding star whose light radiating from agricultural colleges and experiment stations must aid us in solving the difficult problems that beset our calling.

MILKING METHODS.

Milking should be done regularly, gently, quickly, and with the utmost regard for cleanliness. The manner of disposing of the milk must be determined by conditions. If the demands of the local market are such that the product of the dairy can go directly from producer to consumer, either in the form of milk, cream, butter or cheese, it will be an advantage. The dairyman can then take a personal interest in his customers, and make an earnest effort to serve their interests by giving them the best that good cows, good feed and skilled labor can produce. By so doing, he will also serve his own interest, and the effort will pay.

Mr. Chubbuck—Mr. Chairman, ladies and gentlemen: I would like, if Mr. Shepherd will pardon me, to make mention of the fact that the paper just read was prepared and read by a former student of the Missouri Agricultural College. I make this remark to indicate that the Missouri Agricultural College has been able in the past to develop men who make a success of farming. Mr. Shepherd not only theorizes, but has himself been a successful dairyman. We are inclined to attribute a part of his success to his training in the Agricultural College. The paper is a very valuable one, worthy of discussion. The next speaker on the program, Mr. May, is also a student of the Agricultural College. Mr. Shepherd was a student before the College was equipped as it is now for dairy instruction; I have no doubt that he regrets that it was not so well equipped then for dairy instruction as it is now. We would like to have it impressed upon the minds of the people that there has been a change in the character of the instruction since then.

Mr. Allen—One thing I can indorse in that paper that is dairying for winter prices. That is the time of the year we can make most money, and it is the point in which we are ahead of the states further north.

Mr. Lamm—I admired the paper very much. It was not only well prepared but full of practical ideas. Dairying is a practical business, and many of the theories vanish when you get down to hard work. Mr. Shepherd has studied and practiced, and practice is what we want.

Mr. Dow—The completeness of the paper prevents discussion.

Mr. Wood—The difficulty with me, Mr. President, is to make this paper harmonize with the discussions of last night as to why Missouri is behind her sister states in dairying. The sum of the discussions last night was, why she was so far behind in developing dairying? and I do not see how we are to harmonize that with such a intelligent paper.

Mr. Chubbuck—I thought I explained that. The Missouri Agricultural College got in its work more completely here.

Mr. Schoppenhorst—I was prevented being here last night, but I understand the principal discussion was why Missouri is behind other states in dairying. I think I can state one very good reason. We have soil and climate adapted to so many things that we can raise other things with less labor. The dairy business means attention and work at the proper time. We can raise corn, oats, fruits, wheat and spend half our time in town.

David May read the following paper on

BACTERIA IN THE DAIRY.

In discussing this question I shall endeavor to give you the results of most modern researches relating to the subject, to endeavor to make full explanations in regard to scientific terms and to point out as near as possible results where means are obscure. It is with a great deal of hesitancy that I attempt the subject here today. Practical dairymen, like workers in other branches of husbandry, are apt to look with disfavor upon any new methods of food production, and they often hold ideas of their own, or ideas of descent, that they are exceedingly loathe to give up. However that may be, I yet believe that your own experience will bear me out, if not explain, the facts that I shall attempt to explain to you.

In the round of life there are two great agencies at work. With one we have long been more or less familiar. Though we cannot, nor will we ever understand the subtle force that impels and directs, yet we see and are conscious from childhood of the building up processes of life. The seed sinks into the ground; the plant springs up and flourishes. The beasts of the field are nourished by it, even man himself is finally, through these gradual processes, built up from what a few short days ago was the dust of the earth. If this should be all of life we would soon perish. The earth would be throttled by its abundance. But nature is complete, if not perfect, and though the parting with one simple law would destroy the harmony of the universe, yet with a wisdom of which we cannot conceive the great round of life is made complete.

There is another form of activity in nature that is the opposite of the one to which reference has just been made. Its processes have long been familiar to us, but it is only in recent years that with the aid of the microscope have we been able to study its truths. While one force is building up from the elements, plants, animals, even the forms, the bodies we inhabit, at the same time there is another force, strong, alert, ready to tear to pieces again those bodies and resolve them into their elements.

When life leaves a plant or an animal, and their remains are exposed to the air, decay, as we call it, sets in. The microscope has shown us that this decay is usually caused by minute vegetable organisms called by the general name bacteria. Though the study of these little plants is new, it has already been found that there are a great number of them, possibly as many as of the larger plants we see in the world about us. Of those we have studied they present charac-

teristics as different as those shown by the plants that produce the pear and the thistle. While some emit delightful flavors, others cause ravaging diseases in plants as well as in animals. While those that produce disease are relatively very few in number, they have yet caused to be regarded with suspicion by the uninformed, all members of the great family to which they belong.

The higher organized a vegetable or animal product may be, the greater the rapidity with which it will be broken up. Of all the food products known to man, milk is the most perfect. It is both meat and drink to him, and when in a pure state it is palatable to the most exacting stomach. As the milk comes from the udder of the healthy cow it is in a perfectly pure state. If it could be kept free from the air it would remain in this fresh condition indefinitely, but there is no product so easily contaminated by odors and by bacterial growths. Milk is one of the best mediums for the growth of bacteria, and existing as they do on the udder of the cow, in the air, and in countless numbers, especially on all organic substances, it is no wonder that the milk is quickly contaminated by exposure. It is essential then in all dairy manipulations to use the utmost care as regards cleanliness in order that the infection of milk be reduced to the lowest possible point. Though such infection cannot be wholly avoided, yet it can be controlled in part and those obnoxious forms of bacteria that abound in filth be excluded.

Considering the many kinds of bacteria found growing in milk, it is strange that the products of dairying are as similar as they are, yet when one considers the difference between a high grade of butter and the ill-flavored, foul-tasting stuff that sails under the same name, the difference is certainly very noticable. Now all cows kept in a healthy condition will give milk out of which a pure, sweet article of butter may be made, but owing to the ignorance, I might almost say stupidity of man, millions of gallons of this valuable product are allowed to spoil. Hardly has the milk left the udder ere it is contaminated by floating germs of bacteria; especially is this the case in foul, poorly ventilated stables where the milking is often done.

The kinds of bacteria and their products found in milk are many. Prominent among them are the lactic acid ferments producing lactic acid and causing the milk to sour, butyric acid ferment especially noticable in bad butter causing raw acidity; and in the winter or at low temperatures a bacteria causing a bitter taste in the milk, and transmitting it later to the butter.

The object of pasteurization is to destroy by heating the bacterial germs that infest all milk. A great number are killed, yet some are

affected to such a limited extent by heat that they resist its action unless the milk is heated to a degree that gives it a cooked taste. While most bacteria produce a bad effect on milk, there are a few that are necessary to its ripening, and by beginning to tear it assunder give us these very important products, butter and cheese. In the brewing of beer the yeasts or small vegetable forms causing ferments, are under control to such an extent that the brewer may make his products with certainty and with the highest results. No less so may the daryman, if he carefully studies his business, have it under the same perfect control. Certain of the bacteria produce the most favorable changes in milk or cream. This is familiar to you all in the process of ripening. In Denmark, the leading dairy country of the world, these favorable bacteria are cultivated at the experiment stations and distributed at regular intervals to the creameries applying for them. This can be done at small cost, while the advantages to the creameries are great.

In America some very valuable work in this line has been done, notably by Prof. H. W. Conn, of the Storrs Experiment Station, in Connecticut. One species of bacteria described by him is now cultivated by a firm at Waterloo, Ia., and sold to dairymen throughout the west. It adds to the flavor of butter, and Prof. Conn claims even to the product of the best creameries. A sample of butter produced from cream inoculated with this bacteria is shown here today; also butter made in the same dairy just before the culture was used.

That the use of these pure cultures in dairying is advantageous is is already admitted. It only remains to study out the best of these important agents and apply them. In Denmark and Germany and other countries of Europe the dairy interests are in close touch with the experiment stations and the results have been that the aid of science has been applied to this important industry. We are not alive to the importance of this subject. We should not be following Denmark, nor should we be only abreast of her, we should lead. Missouri, with her great resources, should not only produce her own dairy products, but they should be the most valuable of her exports. We need more knowledge on the subject and greater aid from our experiment stations. This winter, for the first time, has any effort been made to teach dairying in our Agricultural College, and even yet we have vacant that very important chair in the Faculty. The department of dairying must be built up in our Agricultural College, and your sons and your daughters must be sent here to learn all that is profitable to be known of this great industry. This meeting will no doubt be of great benefit to you. Yet it will fail of one of its great objects if it does not bring you in closer touch with the Experiment Station and

Agricultural College, and thereby aid all concerned by hastening Missouri onward to that time when she will be the leading dairy State in the Union.

Mr. Allen—I do not see that it takes any harder work to milk a cow than it does to whittle on a goods-box at the corner grocery.

Mr. Chubbuck—Referring to Mr. Schoppenhorst's remarks, and by the way, Mr. Schoppenhorst is a member of the Legislature from Warren county, I was reminded of a remark of Mr. Patterson's that dairying kept one at home, but that if one had a pleasant home it was not a bad thing to be kept there.

Chairman—I am of the opinion that it is a good thing to be kept at home. The gentleman speaks of raising corn, wheat and other articles that are easier. That is so; but we are in a progressive age now, and as the times change we must change. I believe that there is nothing that will pay better than dairy farming; is not hard work if you know how to handle it, and as Mr. Erwin used to say, you must handle a cow as you do a woman, handle her gently.

Mr. Tivy—I would like to ask regarding what gives the bitter taste to butter? There is more loss to the dairymen of Missouri on that one score than on any other. They often get reports that their butter is strong. Strong butter does not get rancid. I would like to ask the gentleman how these are obtained. Butter kept at a low temperature will develop that bacteria that will develop a bitter taste. Explain how that comes and how it can be avoided.

Mr. May—Different bacteria grow at different temperatures. It has been found that the bacteria that causes the bitter taste grows at a low temperature. Pasteurize the cream by heating up to 150 degrees and then cooling rapidly. This will rid it of this bacteria. There are some disinfectants that can be used about the dairy that will prevent its growth. If they are used, be careful to get those which have no bad odor; not carbolic acid. Sulphate of iron, or corperas is good. The main way to fight this is by heat.

Mr. Allen—If the farmer's wife heats it until the wrinkles come, will that pasteurize it?

Mr. May—I think it will answer the purpose.

Mr. Dow—Fast or slowly?

Mr. May—Heat slowly, cool quickly.

Mr. Smith—What degree of temperature must it reach?

Mr. May—I am not able to state.

Mr. Dow—One point made by Mr. May is that milk from healthy cows is pure. I would like to ask if milk from unhealthy cows will be

impure. For instance, if a cow has tuberculosis, will her milk convey that disease to individuals using it?

Mr. May—It will be very apt to communicate the disease to people susceptible to it. That is one of the good things of pasteurization, it destroys the germs of tuberculosis.

Dr. Connoway—I would like to state that there are cases on record of the positive transmission of the disease from the milk of a tuberculous cow. Experiments were conducted in the Agricultural Experiment Station under the auspices of the State Board of Agriculture of Massachusetts in which positive results were obtained from guinea pigs by feeding them milk from tuberculous cattle in which there was a symptom of tuberculosis in the animal. By physical examination you cannot usually determine whether the animal has the disease, yet by precipitating the bacteria from the milk, and by taking the precipitate and making cultures from it and injecting it in the animals susceptible to it, they have the disease developed in them. There are cases of outbreaks of this disease in the human family which have have been traced to this source. We have no positive means of detecting tuberculosis in animals; but Koch's discovery, with which he hoped to cure consumption in the human family, has proved to be a great diagnostic agent. It did not prove a cure, but veterinarians are taking the matter up and are using it in the dairy herds of the East to determine whether or not animals are affected with the disease. I think that our veterinary legislation should be so modified as to require every dairy animal that is brought into the State of Missouri to undergo this test before she is admitted. You have more danger from this source than you imagine; not so much as the Northern States have, because here animals are out in the open air more, and are not housed up so that they can breathe the germs; but we have the matter to look after, and it is a serious matter. I was interested very much in the speeches last night. Some of you said that the cause of failure was the lack of proper cows. If you increase the value of the cow you also increase the danger, for it is a fact that the best cows are more liable to have this disease. The Jerseys are more susceptible to this disease than any other. I believe statistics will bear me out in this. While you are improving your herds look out for this disease, that you may not spread the disease to the human family while you are raking in money in return. I believe butter can transmit tuberculosis.

I will say that I have some mounts made from tuberculous material that any one can see who is interested in the matter.

Mr. Allen—There is one point I would like to ask the scientific man, is there any danger to the calf?

Dr. Connoway—The child at the mother's breast gets disease oftener than in any other way. It was formerly thought that consumption was an hereditary disease. But the other way is more frequent. It can be eradicated by precautionary measures, by avoiding the material that has the infection in it. The calf may escape, while the child drinking that same milk, if it has inherited from its parent a lung that is weak, may contract the disease, while the calf in its rapid growing condition may escape. Yet it is possible that the calf may get it in that way.

Mr. Allen—What degree of heat is necessary to destroy this germ?

Dr. Connoway—Boiling point.

Mr. Shepherd—There is a point right there that is an important one to the dairyman; that is what is the best cow? Our veterinarians say that our best cows are most subject to tuberculosis. I differ with them about that. I think though, that the main difference is in our idea of what the best cow is. Dr. Connoway takes the idea that the cow that has the most prepotent milk temperament is the best cow. I hold that she is the best cow who has the most even balancing of the milk temperament and vital temperament. I have seen some noted cows make wonderful records. This lactificial temperament is stronger than any other temperament. They have a calf, give an enormous amount of milk; their system becomes weak and then they become more susceptible to disease because of the weakening of their system. Now if we change our view a little about what constitutes the best cow and accept the cow with the strong, vigorous constitution, we will have a cow that will give good, healthful milk.

Mr. Dow—If the pig had been given the milk any other way besides injecting it would the results necessarily have been the same?

Dr. Connoway—No, sir. You will have the gastric juice there that will kill the germs. If we did not have this gastric juice we would be much more subject to disease than we are. Fermentation is caused by these germs, and the gastric juice keeps down this fermentation. It is our safety. When the material is injected into the blood we have no such provision. Yet the blood itself is an anti-septic, it has the power of killing some germs. Then you have in addition to this the white blood cells which have the power to take up these germs. We have a great many means of safety and escape. If we had not there would be but few of us here today. An animal is more susceptible through an injection into the blood than in any other way. But the

point is, as sensible men, should not we take every precaution to see that our animals are free from this disease. If we know one to be affected should we not set that one aside and not give her milk to our neighbor?

Mr. Dow—What are the outward indications that will lead us to suspect this disease?

Dr. Connoway—In the early stages we have no means to suspect it. It is only in the very advanced stages that we can detect it. We have tuberculin to tell whether the animal is affected even in the slightest degree. It causes an elevation of temperature of about three degrees in about twelve hours after its injection. In the great majority of cases, these animals after being slaughtered have been found to be tuberculous. Sometimes we do not find it until we get to the udder. I have in my microscopical collection a section of an udder showing this baccillus.

Mr. Smith—Is there not a simpler method by which it can be detected, by analysis of the milk, for instance?

Dr. Connoway—No, not in the early stages. After it has advanced it may be told by listening to certain sounds in the lungs. But it may not be in the lungs, it may be in the intestines; then you cannot diagnose it until the animal is slaughtered. Most people associate tuberculosis with the lungs. Any part of the body may have the disease.

HOW DAIRYING IS BEING DEVELOPED IN WESTERN KANSAS AND EASTERN COLORADO.

B. Morehead, St. Louis, Mo.

The famous saying of Horace Greely, "Go West, young man, go West and grow up with the country," is even more full of wisdom today than when uttered by the great editor twenty-five years ago. The West, with its great resources and unbounded possibilities, affords unequalled opportunities to men in every walk of life, to the poor as well as to the rich. To the farmer with habits of industry, sobriety and frugality, together with intelligent management, no country offers greater advantages, and nowhere can a poor man make a more favorable start under the circumstances. This is especially true concerning the country situated in Western Kansas and Eastern Colorado, upon which I desire to speak.

The territory which I particularly wish to call your attention to is a strip 50 miles wide by 275 long, extending along the line of the Missouri Pacific railway from Hoisington, Kas., to Ordway, Col. Here

we have a superb climate, the Switzerland of America, in which the dairy cow may be at her best; the atmosphere is dry and pure, and the native born have never known pulmonary trouble in any form. The winters are short and mild, thereby allowing stock to follow the range almost the year round. It is also peculiar to this section that the snow lies on the ground but a short time, and there are no sudden changes. For the past seven winters it has not been necessary to feed the stock for more than an average of two weeks each season.

Considering the advantages before mentioned there is less labor and expense required to handle cows and their product than in any other dairy section familiar to me.

The feed on the range consists of many kinds of grasses, the following being the most common: Buffalo (the king of them all), Blue Stem, Gramma, Bunch, Cheat and Cotton Top. These all thrive in this arid country, and almost every year a crop of Gramma hay can be harvested, which is claimed to be equal to any hay grown. These grasses in their season supply pasture on the range throughout the year, and by reason of nature curing them while they grow, as much nutritious value is left in them for winter pasture as though cured and fed from the stack. Buffalo grass has a constant growth all the year. In the spring the new blade growing from the bottom sheds the old cover. It is green at the bottom the winter through, and this keeps the system of the stock sufficiently loose, and in the spring the old grass fed with the new prevents scouring. Another important feature of Buffalo grass is the corn which grows on it, and which is superior to Indian corn. This accounts for the character of the beef from the Buffalo grass ranges of the West, being equal to any corn fed beef. Cows feeding on this grass test equal to the same kind of cows fed on grain rations East.

The range is good and free almost throughout the entire year, and indeed the good qualities of the grasses mentioned seem to be more prominent during the fall and winter seasons. As before stated, feeding is only necessary during a very short period of the year and for this fodder can be raised, while the proximity to the vast alfalfa fields in the irrigated districts always insures an abundance of cheap feed under the most adverse circumstances.

The dairy interest is one of the unfailing resources of the West and its beneficial influence is felt at once by all those who engage in it. It is rapidly becoming prominent as one of the resources of the great plains and there is no limit to its future development. Millions of acres of these most nutritious grasses grown in this country, declared

by experts to be unequalled as producers of butter-fat, are awaiting the farmer and his cows.

The problem as to how best utilize this fine range and climate seems to have been solved by the late Mr. Jay Gould in the summer of 1892. At that time Mr. Gould was making an inspection of the western lines of the Missouri Pacific railway and had his car set out at a siding near the village of Eads, in the eastern part of Colorado. During his brief stay there he was supplied with milk and butter by one of the neighboring ranchman. These two articles were of such an excellent quality that after a careful inspection of the surroundings he became impressed with the idea that this was a dairy country and that this industry should be developed at once. He immediately communicated with the officers of the American Refrigerator Transit Company (who operate the perishable department of the Missouri Pacific railway), presenting his suggestions and advising them to look into the matter, and, if deemed feasible, establish an experimental creamery plant as soon as possible.

Acting upon these suggestions, the A. R. T. Co. promptly secured the services of a practical dairyman and sent him West with instructions to carefully investigate the matter. The report of the agent, after a rigid inspection of the territory and its adaptibility for dairy purposes, was so extremely favorable that it was decided to erect a butter and cheese factory, equipped with the latest improved machinery, and locate the same at Eads, Colorado.

Work was commenced about April 1, 1893, and by June of the same year the plant was completed and put in opperation. A short time after the factory was started it became apparent that more milk could be handled than could be supplied in the immediate vicinity of Eads, and it was decided to establish skimming stations at various points along the line of the Missouri Pacific railway. Subsequently skimming stations have been established at Towner and Stuart, Colorado, and Tribune, Kansas, and another is now being located at Leoti, Kansas, and it is expected that at least three other stations will be built during 1895.

The creamery business has been a God-send to the people living in the locality mentioned. Not only the farmers and their wives are saved the arduous labor of churning, but the prices received by them have been far in excess of that of home made butter and there is no limit to the quantity that can be furnished.

The butter made by the creameries is eagerly sought after in the mining and manufacturing districts, where the demand cannot be sup-

plied by the country adjacent, and prices received for the product are better than the Elgin market the year round.

The patrons of the Eads Creamery Company, with no special dairy stock on hand and no other feed than that furnished by the prairie, have received in two years and a half $10,000 in cash. This is not a very large amount when distributed among fifty families, but it comes regularly every month, and serves as a very nice pension.

While dairying in the West is annually growing in importance the creameries and cheese factories have often more local orders than they can supply. The fact is there are not nearly enough milch cows in the West to supply the home market for dairy products. While some of the dairymen are conducting the business on the most improved methods, and are consequently making money, others, who sell milk to the creameries, keep cows which do not yield more than eight quarts a day, and do not milk some of their stock to exceed three months of the year. In fact, these cows are simply range stock producing calves and some milk. The creameries pay an average price the year round of eighty (80) cents per 100 pounds for fresh milk, and keep only the separated cream. What Western Kansas and Eastern Colorado particularly need is more and better grades of dairy cows. The scrubby range stock must be displaced for the Jersey and Holstein, and this is now being done as rapidly as the limited means of the farmers will permit.

I am informed that Colorado has today 50 successful creameries and cheese factories, and Kansas 115. Colorado is making greater advancement along this line perhaps than Kansas, but there is scarcely any possibility of overdoing the number when we take into consideration that Wisconsin has over 3500 established creameries in successful operation.

Water can be found at from 30 to 75 feet, and an 8-foot wind-mill will pump sufficient water to irrigate two to five acres of ground by using a reservoir.

In conclusion, would state that any man with $500 can fit himself with a home and 20 good cows, wind-mill and irrigating plant, and begin life like a prince as compared with life in the East with that amount of capital.

He can make an easy living with from three to four hours work per day by selling milk from these cows, and he won't have to hustle like our Eastern friends are accustomed to.

Taking into full consideration the advancement that has been made in the dairy industry in the West during the past few years, and fully appreciating the natural advantages possessed by this section, I

am constrained to look upon the future dairy operations in Kansas and Colorado with a great deal of hopeful anticipation.

Mr. Harris—Permit an outsider, not a dairyman, to say a few words. I am sorry to take issue with the gentleman on that paper. In the first place, he starts out with the motto of Horace Greeley. Since I have become of mature years and have some boys and girls of my own, I have taken issue with Horace Greeley. I believe that the boy and girl properly instructed at home can do better at home among his friends than anywhere else, if he has any merit in him. We are here to build up the interests of Missouri dairying, and not away out West along Mr. Gould's railroads. I was born and raised in that country where a fellow thinks there is no other country, Kentucky, but Missouri is as good as Kentucky or any other country. To sum this thing up in a nutshell, the fact is, that heretofore Missourians have been accustomed to live like lords. I do not know whether we can do that today or not; it may be that times have changed. I think the time has come when we must mix these industries. We bought these farms cheap, they were productive and it permitted us with a few thousand dollars to get good homes, just as good as Mr. Gould had with his millions. We had our private carriages, drivers and all the good things of the land just as though we had millions. But the times have changed, and it is possible that we must go to work in these matters that heretofore we have paid no attention to. But my advice is, if you are any account, stay where you are, and if not, go out West.

I think Horace Greeley is misrepresented. When he gave this advice, Missouri was away out West, and I think he was about right when he told the people to go West, only he should have told them to stop in Missouri.

Hold the boys and girls that we raise here, and we will soon have enough of them.

Mr. Moorehead—The gentleman seem to take exceptions to my paper, because of deal with dairying in Colorado. I was put on the program for that subject, and I couldn't very well come back to Missouri dairying and stick to my subject.

Mr. Lamm explains map for dividing the State into dairy districts corresponding to the Judicial districts and appointing a dairy commissioner for each district.

Mr. Lamm—I think we should present this idea to the Board of Agriculture. I have consulted with the dairymen from my part of the State, and we think it would be far better to have an agent for each

district. The agent need not necessarily be a dairyman, though better if he is, but he should look after the interests of dairying, the enforcement of the law, accumulate facts, encourage the dairy interests in every way he can. There was appropriated $5000 for the dairy interests for two years. We would like to have a good man in each of these districts. It will be better that he be a dairyman because every interest prospers best in the hands of its friends. This money should be divided up among these different men; they should have their appropriation as to the work they do and the dairy interests involved in these divisions. The appropriation should be divided to correspond with the advancement of the interest. We want an expression of your opinion as to the utility of this project, because our interests are growing. I advocate this plan because I believe it will reach us and will solve the question better than in any other way. We had a hard fight to get the oleo bill passed. Mr. Armour is never sleeping. There is neither brains nor ability that he has not at his command. He is always looking after his interests. He will unite with any class of men who will say our cattle are diseased. I like to see a man look after his business, and that Mr. Armour is looking after his business is no reason why we should not be looking after ours. The fact that he is pushing his business is no reason why we should not push ours. I like to be at work myself, and I do not envy the man who succeeds, but I want him to keep along legitimate lines.

We were not organized properly. We were not doing what we should do. We should have a man in these districts to look up these things and to keep the people in touch with the Board of Agriculture and to report to the Secretary of the Board. Have these men in touch with the Board of Agriculture and with each other and we can build up our interests in this way. I want the idea before the Board, as either approved or condemned by this Association and this may help the Board in their ideas in this matter. We are trying to build up our interests; they are not. It is our duty to keep them posted. At Jefferson City last winter there were Senators, intelligent men, who did not know there was such a thing as oleo. I think they are true men, who will work for our interests if they know what those interests are. I would like to have an expression on this matter; I would like to come to some conclusion. The Board meets today. We must present this matter to them at once.

Mr. Allen—I am in favor of having some one appointed, as Mr. Lamm says, with the understanding that he be a representative dairyman who understands the work and is capable of improving it.

Mr. Chubbuck—I have not heard all of the presentation of the case so that I do not fully understand the representations made by Mr. Lamm. But I presume that he has prepared this map, dividing the State into districts, and advocates asking the Board to appoint a commissioner for each district. I believe that this plan will be found impracticable. I do not believe we can find competent men in all the districts to do this work. I think it would be far better to have one man supervise this enforcement throughout the State than to have some incompetent men. If the competent men can be found I do not know that I would have any objection to it other than that I think the expense would be greater than by having a smaller number.

In considering this matter I think it would be well for Missouri to imitate other states that have made a success of this enforcement. Other states have to contend with oleo. Our appropriation is small, and if we divide the State up in this way it will make so many men amenable to the Board of Agriculture that it would devolve a great deal of extra work on the Board. I hope to see the day when there will be a commissioner for every county, but we are now too young. I think this plan of dividing would make too much work and too much expense.

Member—I would ask the gentleman if he has ever considered whether or not this work could not be done better by the Dairy Association? Would it not be better to place all this matter in the hands of the Dairy Association than in the hands of the State Board of Agriculture?

Mr. Lamm—I believe that all that has ever been done has been done by the Association, and I presume that all that ever will be done will be done by this Association. We must look after our business ourselves. We must get men in different localities interested in these things. I believe we will be as liable to get good men for all the districts as we are to get one good man for all the State. My opinion is that this is the right plan. We have a congressman for each district in the State. Why not say that it would be better to only have one for the whole State for fear we would get some bad ones. The case is the same. You want a special man wherever the dairy interests are being developed; somebody that you will have confidence in. The Board of Agriculture can just as easily make a mistake in appointing one man as in appointing nine. The great idea seems to be the centralization of power. I have been here before, and I will tell you you want to get down to the people; you want to get them interested in the work; get them to take hold of the work, and then it will grow. If you want your interests to grow, put them in the hands of the men who love them. We

can do this by this method. We want our interests placed in the hands of our friends.

Mr. Chubbuck—It may strike those present that what I shall read here shoots wide of the mark, but I think there is a principle underlying it which bears on the discussion. I have this in the form of a resolution:

Resolved, That the State Board of Agriculture should be recognized as having supervision over the agricultural interests of the State, uniting under its head the various agricultural associations of the State, such as the Dairy Association, etc.; therefore, we respectfully ask the Board to devise a plan of co-operation which will develop a symmetrical agriculture.

The State Board of Agriculture has a broader field of action than the farmers recognize, or they themselves recognize. The word "agriculture" is not confined to the raising of corn and cattle, but it includes horticulture, dairying and all the various lines of farming. When the present law was drafted it was specifically stated in it that the Governor in making appointments on the Board of Agriculture should recognize the different agricultural industries of the State with the idea of developing that symmetrical agriculture that is referred to in these resolutions. It does seem to me that if any state in the Union can boast of varied resources, Missouri can. And it seems to me more important in this State that the Board of Agriculture should carry on this work on a broad basis; therefore, it has been my hope that the Board would recognize these different lines. You heard from our chairman last night that at a Farmers' Institute held at Higginsville he was led into the dairying business. It seems to me that the Board of Agriculture can devise a plan of action that will do more to develop the dairy interest in this State than we can do if they will recognize that principle and work along those lines. We must work under the leadership of the Board of Agriculture, and the Board must recognize the broad field of action before it. We can do more under them than as a separate organization. I would suggest that as an association we recognize the State Board of Agriculture as at the head of these various organizations, and if they have not recognized this principle, bring them to its recognition, and if we see fit to adopt this resolution, add to it that they ask the Legislature for a certain sum of money to be used for the Dairy Association, and ask for the appointment of a dairy commissioner. We have not the legal authority for that yet. The oleo law does not confer it. It simply states that the Board shall enforce the law.

Mr. Dow—Ask them that at each of their institutes they shall have an expert butter and cheese maker who shall give a practical lesson in the best methods of butter and cheese making.

Mr. Lamm—I must say a word in explanation of what I said about the Farmers' Institutes. I did get a great many good points from Mr. Waters' speech; I was very much benefited by it. I do not think there was anything said on dairying.

We have the right to ask the Board of Agriculture to pay a man to look after these different districts, and they have the money to do it. We asked for the money; we fought for it; we begged for it, and we got it. They have a right to pay Mr. Chubbuck to look after the dairy interests in his district. They have the money and I believe if we ask them they will do it. They want to be in sympathy with us. They are broad, honest men, with good sense, but they are not going to do a thing unless you want them to do it. Their business is to do for the people what is best. My plan is simple; will you recommend that a committee be appointed to ask the Board to divide our State into districts?

Mr. Chubbuck—Do you recommend that these commissioners be paid from the $5000 appropriated?

Mr. Lamm—Yes; the same as an agent for the whole State.

Mr. Chubbuck—If he is to awaken a dairy interest by imparting instruction and gathering statistics as you suggest, it will not be permitted under the law. This $5000 can only be used for the single purpose of enforcing the law. Your recommendations in this respect must be confined to the single purpose of enforcing the law.

A motion prevailed to the effect that a committee of three be appointed to present to the Board of Agriculture any suggestions which should be adopted by the Convention.

The Chair appointed on the committee Messrs. Lamm, Rice and Chubbuck.

On motion by Mr. Dow, the committee was instructed to present Mr. Lamm's plan.

On motion, the committee was instructed to present to the Board the resolution made by Mr. Chubbuck.

After which the Convention adjourned to meet at 7:30 p. m.

The afternoon was spent at the College Farm Dairy, witnessing dairy tests and operations.

TUESDAY EVENING, January 14, 1896.

House called to order by Chairman.

Prof. Mumford presented a paper and explanation of "The score card."

Mr. Chubbuck—The next paper on the program is by Mr. Cabanne, of the St. Louis Dairy Co., on "Milk supply in large cities." I wish

there was someone who could talk on this subject, as Mr. Cabanne is not present.

Mr. Tivy—Mr. Cabanne was a delegate to the National Association at Chicago.

Mr. Chubbuck—I asked Mr. Cabanne to take this subject, because the amount of milk consumed in large cities is very great, and the subject should be one of interest to the members of the Dairy Association. I recently had occasion to visit St. Louis and look into the matter of the city milk supply. I found a strange state of affairs. I found that there were within St. Louis 12,000 cows producing milk for St. Louis; producing very nearly three-fourths of the milk that was consumed in that city. That might be all right, but under the conditions that these cows are kept, to my mind, the milk is a source of danger to the users of that milk. That being the case, it is perfectly right that there be brought about a change in the state of affairs. That would throw open to the producers of country milk that supply and make it a matter of dollars and cents to the members of the State Dairy Association. It was with some of these facts in mind that I requested Mr. Cabanne to attend this meeting, and present facts as he knows them. It may be that there are some present who are familiar with these facts, and can tell us something about them. I see Mr. Kennett, representing the Burlington route, here, who is somewhat familiar with these things.

Mr. Kennett—I do not believe I could tell you anything more than Mr. Chubbuck has already told you. The state of affairs exists that he tells you of. I brought the question before you at your last meeting at Higginsville. Owing to a peculiar state of affairs the city government is powerless to handle the subject. It will have to be done by the State Legislature, and I think the members of the Dairy Association are the proper people to take it in hand. As Mr. Chubbuck says, there are 12,000 cows. These cows, the bulk of them are kept in stables in the most thickly inhabited portions of the city. They are fed distillery swill. A great many of the cows never see daylight from the time they go into the stable until they leave it for the slaughter house. In some of the stables the cows are covered with filth, and the people who milk the cows are as filthy as the cows themselves. There have been a number of attempts to regulate the matter in the city; in fact every year there is some effort to get legislation on the subject, but as the city dairies are the only outlet for the breweries and distileries, and as the breweries and distileries are important factors in city politics, it is almost impossible to do anything. There

was a law passed several years ago, and it was a very good one, but it was repealed.

The situation in Kansas City with which I am not quite so familiar is not so bad. They have very good laws there recently passed, which have driven a great many of these city dairies out of the city. It seems to me that this is a question that the State Dairy Association should take up. There should be somebody in the State with the proper legislation behind them to see that the inhabitants of the cities are supplied with pure and healthy milk.

Mr. Dow—I would like to ask the gentleman what the price of milk is in St. Louis?

Mr. Kennett—It varies according with the season. In May and June it is as low as 9 cents a gallon at wholesale. That is the price the farmer gets for his milk delivered at the depot in the city. Just at present it is bringing from 12 to 13 cents. I have known it to bring 15 cents. The consumption of milk is from 50,000 to 60,000 gallons a day. The farmers are only selling about 12,000 gallons in the city.

Mr. Tivy—There is at present a bill before the city council for the inspection of these dairies. Health Commissioner Starkloff has worked very hard for it. Some of the dairies are already out of the city limits. They have found some disease in the stables already that has been spreading.

Mr. Kennett—This agitation has been going on for several years, but the city authorities are powerless to do anything. There is a law now but it does not give the milk inspector any power to close up a dairy or drive it out of business.

Mr. Chubbuck—In visiting some of the St. Louis dairies in company with the inspector of dairies working under the law that Mr. Kennett refers to that does not really give them authority to do anything, but to find out something, we happened to go into one when there was no one present and the inspector found a vessel containing some material, a portion of which he obtained for me. He told me that this material was used by the dairymen with which to doctor their milk. He said this would not only give color to the milk, but it would actually produce an artificial cream. I could hardly credit the statement, but he told me to try it. I brought some of it home with me and tried it in a glass in which I had put some skimmed milk and water, putting in a few drops of the material, and in the morning I was surprised to find a rich, heavy cream on top of the milk. When I was in Kansas City the inspector there told me what this substance was made of glycerine, cotton seed oil and sodium carbonade, with coloring matter. This put in the milk produces a soapy substance which

rises to the surface like cream. In another dairy that we visited we found another vessel containing, I suppose, the same substance. The proprietor was absent and the inspector got in conversation with a young man there, and by a series of shrewd questions found that they used it principally on Fridays, because the demand for milk is greater on Saturdays than on any other day. "We would not have enough natural milk to supply our customers on Saturdays, so we have to use something to increase our supply," he said. This fraud is practiced on the people of St. Louis. And the conditions in which the cows are kept is producing a very unwholesome supply of milk. It is a matter that should be attended to by the Legislature.

Prize paper read by Secretary:

HOW TO MAKE THE BEST BUTTER.

By W. A. Vandiver.

Good butter may be made under very difficult circumstances, but the best butter must be made under the best circumstances.

The first requisite is the dairy cow, such as the Jersey, Guernsey or Holstein. The cow should never have any decayed or damaged food to eat, as it is sure to tell by imparting a bad flavor to the butter. She should also have an abundance of pure, fresh water at her disposal. The next thing is the proper feed for the cow.

No feed has been found that will produce such delicate aroma, such good keeping qualities, and such rich color as the blue grass pastures during the months of May and June. After June, the grass in most seasons is too mature to produce the highest qualities.

Of the grain feeds a mixture of ground oats, corn and wheat bran, equal parts, together with nicely cured clover hay or timothy, early cut, will give to the butter a high flavor that cannot be produced by any other combinations of grains. Sweet ensilage may be added to this feed without hurting the quality of the butter.

Under no circumstance should moulded or damaged food of any kind be given to the cow, unless you wish to give to the butter the mouldy taste of the feed.

For the highest class butter, such feeds as cotton seed meal, linseed meal, over-ripe timothy hay, or over-ripe corn fodder which has been exposed to the weather all winter should be avoided, although with these feeds good butter may be made.

The best butter cannot be made from strippers' milk, for the finest quality the cows should be comparatively fresh.

MILKING.

The old adage that "cleanliness is next to godliness," is no truer in any other business than in dairying, and is no truer in any other part of the dairy than in the milking. The cow's udder and teats should be well washed and dried before milking. Always milk with dry hands. All milk vessels should be metal and thoroughly scalded and aired before using. The milk should be removed from the stable as soon as drawn to prevent its becoming contaminated with the foul odors from the stables. It is claimed by some, however, that milk will not take up these odors while it is cooling, but I think I have found by practical experience that it will.

Separate the cream from the milk while the animal heat is still in it. Cool your cream down to about 40° by submerging it in ice water, and hold until you have enough cream for a churning, stirring the whole mass each time fresh cream is added.

In ripening the cream the temperature should be raised to about 70° and held at that temperature about 18 hours, when it will be in the best condition for churning. It appears from my very limited experience, that with Conn's Pure Culture as a starter, better flavored butter can be made than by the old process of natural souring. Whatever process of ripening you use, cool your cream down to 58° or 60° before putting it into the churn. I would say concerning the exact temperature at which to churn, that there are so many conditions affecting this, such as the richness of the cream and the temperature at which it has been ripened, that the best rule to follow is to churn your cream at the temperature that will give you a nice granular butter in about 30 to 35 minutes; longer than this is time and labor badly spent.

As it is necessary to use some artificial coloring during most seasons of the year, use none but the very best, such as Chris Hensen's or the Wells-Richardson. Use sufficient quantity to bring your butter to the rich June color, as nearly as possible. The color should be poured into the cream and thoroughly mixed before starting the churn.

The churn should be prepared by first scalding thoroughly, then rinsing with ice water. Put your cream into the churn, revolving the churn until the butter granules have attained the size of a millet seed or slightly larger; then stop the churn, draw off the buttermilk by removing the plug from the bottom of the churn and straining the buttermilk through a hair-strainer to save all the granules of butter. After your buttermilk has been drawn off wash the butter with clean water about 6 or 8 degrees cooler than the butter, revolving the churn very rapidly. Remove plug to draw off this water just as you did to draw

off the buttermilk. Wash again in sufficient water to entirely float the butter, add a little salt and wash as before, this time having the water ice-cold, remove the plug and drain out all the water possible. Then remove the butter from the churn, placing it on a nice, clean cloth wrung out of ice-water, salt to suit the taste while in the granular form by stirring the butter well with the butter-fork.

Never use anything but the best dairy salt, such as Higgins', Worcester's or Ashton's.

Now let the butter stand 10 or 12 hours, then work sufficiently to thoroughly distribute the salt and remove all the water possible, being careful not to break down any of the granules, thereby making the butter smeary. Put it up in an attractive print, wrap in parchment paper, when it is ready to be delivered to the customer.

WEDNESDAY MORNING, Jan. 15, 1896.

House called to order by Chairman Bruns, and Joe Hickel of St. Louis, read the following paper:

HOW TO MARKET BUTTER.

By request of our worthy Secretary I have the honor of addressing this convention on the subject of marketing dairy products.

One of the most important points is the quality. Care should be taken that it be kept up to the highest standard, and have it run uniform in quality, thereby establishing a reputation for itself, and commanding the highest market price. I remarked that the highest standard of quality was important to command high prices; in that connection it is proper that I should state the requirements of such standard: First, the butter must have an extra high flavor, this being at the head of the list. It should be noticeable to the sense of smell as quickly as the cover of the tub is opened up as well as when the keen nose of the buyer is passed along the butter tryer which is run down in the tub and brings its sample from top to bottom, from which almost any fault can be smelled, tasted or seen. In addition, the butter must not be milky or mottled, but must show a good solid body. The salting of butter is an important matter. Too light salting causes the butter to turn very fast; being over-salted gives it a briny taste. One ounce of salt to a pound of butter should be about right. This helps to keep it, and assists in flavor.

Butter consigned to St. Louis should be colored a fair June color, as light-colored butter is not wanted in our market and is very hard to sell. Sometimes creameries pack two different colors in one pack-

age, which effects the sale and usually sells for a couple of cents less than if it were straight in color. Another very objectionable practice of some creameries is working in too much brine. It effects the value of the butter by continuous leaking out and making the package very dirty and distasteful to the eye, thus hurting the sale.

A feature of much importance in selling butter is the style of package. In my experience I find white ash wood tubs the best. Always see that each package is clean and bright, also avoid using clasps and hooks. Tin fasteners make the package much more neat and ofttimes assist in making a sale. Three tin fasteners are sufficient to hold down the cover. It makes no difference as to the size of the package, but this should be well filled to the top, and always use cloth circles in preference to paper circles, especially in summer when paper wrinkles up with the butter and looks badly, making it necessary to overhaul the tops and straighten out to make it salable.

The following paper was read by President Bruns:

WHAT DAIRYING HAS DONE FOR LAFAYETTE COUNTY.

W. H. Bruns, Concordia, Mo.

Three creameries in Lafayette county, Concordia, Alma and Mayview creameries, received during 1895 4,640,834 pounds of milk, made 194,965 pounds of butter, and paid to the 200 patrons $29,640.29. There are three other creameries in the county not heard from, Corder, Napoleon and Henning. These would probably swell the total to $50,000 paid to patrons of the creameries of Lafayette county in one year.

About one-third of the farmers in the neighborhood of the creameries are patrons. These have, on an average 12 cows, but the number is increasing. Some will have as high as 40 cows next year. Concordia creamery has 100 patrons.

The cows are principally Shorthorn and Jerseys. The people are just waking up to the value of the butter-fat test of milk; and to the fact that it does not take any more feed to make a gallon of rich milk than one of poor milk.

Cows are being milked 10 months out of 12. We have six months of blue grass, timothy and clover pasture. In the winter the cows are stabled and fed corn and corn-stover cut fine, so it can be fed in a manger.

Wells are our main supply of water.

Our creameries are mainly run on the co-operative plan. All use separators. The Concordia creamery handles as high as 14,000 pounds of milk a day. They can separate 3300 pounds of milk an hour, using a Jumbo separator.

Five of the creameries of the county pay for milk on the butter-fat basis, the average price being 17¾ cents per pound.

No milk is received on Sundays.

The longest drive to a creamery is eight miles.

Butter is packed in 60-pound tubs and sold in St. Louis.

If we had better cows we would have had more money. I can plainly see that our cows should be twice as good as they are, or in other words, should make double the amount of butter they do. So it is very plain that if we breed up in the right direction we can make dairying pay better than any other branch of farming.

I would like to ask which is the best paying cow; one that gives five per cent milk and a medium flow, or one that gives three per cent milk and a large flow?

I think we ought not to have hard feelings toward one another about different breeds of cows, but discuss their butter-making qualities from the practical standpoint of greatest profit, and find out which is the cheapest way to make a pound of butter, whether with a cow that has a large per cent of butter-fat and medium flow of milk or one that has a small per cent of fat and large flow.

Which is cheaper, to have two large cows that make a profit of say $80 a year or three small ones making the same profit? Which is best for us to breed for, an all-purpose or a special cow?

Some of our patrons have an idea it is better to make something out of our steer calves by feeding them on skim milk, and others think the milk is worth more fed to pigs.

Mr. Waters—In answer to a question, I will say that that question cannot be answered definitely as to whether a five or three per cent cow is most economical. The results from Experiment Stations indicate that we are unable yet to trust the relation of the amount of butter to the cheapness with which we can produce butter-fat. In other words, there is something else which we have not yet discovered. A cow that will test three parts may possibly be most profitable. You cannot tell about that. The impression is, however, that the five per cent cow is better. A Cornell test showed that a three per cent cow made butter cheaper than a five per cent cow.

Mr. Smith—Can Mr. Waters tell us anything about the quality of the butter? We must take that into consideration.

Mr. Waters—That opens a big question. The opinion of the best authorities on the subject today is that the cow under ordinary cir-

cumstances will have less influence upon the quality of butter while the period of lactation will have some influence on it. The manner in which the milk is kept has more influence than the cow herself, except when you are feeding for direct results. This was the opinion of the leading scientists as printed in a leading Eastern paper last year. We have cases where individual cows will make better butter than others; make butter that will sell for 75 cents the year round.

Question: Which is the most profitable, to breed for the special dairy cow or the all-purpose cow?

Mr. Allen—That depends on how you are situated. If you have a good market, use the special dairy cow, but if not, get a cow whose steer calves will be worth something.

Mr. Waters—I think a good deal of the Shorthorn as a dairy cow. I believe the World's Fair test placed her in the proper position when she stood third as a dairy animal. She would probably have stood at the bottom if every breed had been represented. In other words, the special dairy cow will produce dairy products cheaper than the all purpose cow. I think the question can be answered very positively by saying have a special purpose cow, and giving that cow the best dairy treatment. At least the combination cow has not been produced yet. Why not avail ourselves of the efforts of the men who have been developing the special purpose cow for a number of years by adopting the special dairy cow for the dairy.

Mr. Harmon—We want to run on the general principle with rotation of crops, and we want a rotation of products to sell. The average farmer, after having tried the special dairy cow, has not been successful because we do not have the dairy facilities.

There are cows and cows in all breeds; so in the Shorthorn. I would call your attention to the London show where the Shorthorn or grade won the premium as a dairy cow. An average hand can handle ten of these cows and their products.

The special purpose cow is the cow that will give the most milk for the least feed. We want rotation of crops because we want to feed these cattle. The Holstein has some good beef qualities; so has the Guernsey. From the Duchess, Mrs. Mott, Princess and other strains that have been perpetuated in purity you can get a cow that will make butter, and you can have your rotation of crops too. Corn we must have and clover we certainly cannot do without. There are other lines of profit on the farm. We want to combine these and not attempt to make a specialty of one thing. We will not ask for the Shorthorn, but with a good average beef cow we will produce a good amount of milk.

REPORT OF COMMITTEE ON AWARDS.

SCORE CARD.

Class "A," Creamery Print or Roll.

Name.	Postoffice.	Entry....	Flavor ..	Texture.	Color....	Salt. ...	Package	Total...
T. F. Powers.....	Memphis	1	40	27½	9	9	5	90½
J J. Smith.....	Sweet Springs...	2	40½	28	9	9½	5	92

Class "B," Creamery Tub.

Alma Creamery	Alma	1	42½	27	9	8¾	4	91¼
Mayview Creamery Co. ..	Mayview	2	41	28½	10	10	5	94½
Star Creamery.....	Rosendale.	3	41½	26½	8½	8¾	4	89¼
J. J. Smith.	Sweet Springs...	4	40	27	7	10	4	88
Wm. Henning.....	Alma	5	41	27½	9	9	4	90½
Wien Creamery	Wien	6	40½	27	10	9	4	90½
Norborne Creamery.....	Norborne	7	41	28	9	9½	4	91½
New Era Creamery.....	New Melle.....	8	41	28½	9	9	4	91½
C. S. Stevens.....	Garden City.	9	41½	28	8¾	10	4	92¼

Class "C," Dairy Print or Roll.

Name.	Postoffice.	Entry.	Flavor	Texture	Color.	Salt.	Package.	Total.
D. D. Moss	Columbia	1	40	28	8½	9	5	90½
L. S. Haris	Columbia	2	40½	28	8¾	9	5	91¼
Horace Stearns	Crawford	3	39	28	9	9½	5	90½
C. J. Hogan	Hematite	4	41½	27½	9	9½	5	92½
C. J. Hogan	Hematite	5	41	27½	8¾	9	5	91¼
W. A. Smith	Rocheport	6	40	28	8½	8¾	5	90¼
G. B. Lamm	Sedalia	7	39	27½	8½	8½	5	88½
S. W. Coleman	Sedalia	8	40	29	8	8	5	90
Mrs. B. R. Cauthorn	Mexico	9	40½	26	8	9½	5	89
L. T. Henry	Deer Park	10	41	28	8½	9½	5	92
R. F. Flemming	Sedalia	11	39	28	8	9	5	89
Mrs. Evans Young	Lexington	12	40	26½	8	8	5	87½
Mary Thompson	Columbia	13	40½	27½	8¾	8¾	5	90½
T. M. Hoady	Pettis county	14	40½	28	9	9	5	91½
Mrs. W. J. Downing	Columbia	15	40	27	8	8½	5	89

Cheese.

James Taylor	Newark	1	37	27	11	8	9	92

W. N. TIVY,
A. H. SHEPHERD,
J. H. SMITH,
Judges.

AWARD OF PREMIUMS ON DAIRY EXHIBIT.

The State Board of Agriculture offered the following prizes on dairy products manufactured in Missouri and by the party making the exhibit:

Best sample butter, creamery print or roll, not less than one or more than five pounds, first premium $7, second $3.

Best sample butter, dairy print or roll, not less than one or more than five pounds, first premium $7, second $3.

Best tub creamery butter, not less than twenty pounds, first premium $7, second $3.

Best cream cheddar cheese, not less than ten pounds, first premium $7, second $3.

Best paper on making butter in Missouri, limited to two thousand words, $10.

SCALE OF POINTS ADOPTED BY THE DAIRY ASSOCIATION.

Butter—Flavor, 45; texture, 30; color, 10; salting, 10; package, 5; total, 100.

Cheese—Flavor, 40; texture, 30; style, 12; salting, 8; color, 10; total, 100.

AWARDS.

Creamery Print Butter.

Name.	Postoffice.	Premium.
J. J. Smith	Sweet Springs	First
T. F. Powers	Memphis	Second

Creamery Tub Butter.

Mayview Creamery	Mayview	First
C. S. Stevens	Garden City	Second

Dairy Butter.

C. J. Hogan	Hematite	First
L. T. Henry	Deer Park	Second

Cheese.

James Taylor	Newark	First

Paper, W. A. Vandiver, Columbia.

It was moved and seconded that the committee on awards be tendered a vote of thanks.

Secretary Chubbuck read a list of members of the Association and extended an invitation to those present to become members.

An invitation from Dr. Jesse to visit the University was presented and accepted.

BUSINESS SESSION.

The convention now resolved itself into a business session for the purpose of transacting the annual business of the Missouri State Dairy Association.

The minutes of the last meeting as printed in the 27th Annual Report of the State Board of Agriculture were on motion accepted as printed.

SECRETARY'S REPORT.

Mr. President—In my report made one year ago at the Higginsville meeting, after reviewing the life history of the Missouri State Dairymen's Association, I attempted to set forth some of the reasons why the Dairy Industry had not developed faster in Missouri. It was assumed without argument that Missouri possessed unsurpassed natural advantages for dairying, climate and soil that enabled our farmers to produce cow food in great variety and cheaply, and which made it a comparatively easy matter to provide shelter, good water and accessibility to markets.

The difficulties to contend with were grouped under three heads:

1. Lack of co-operation.
2. Lack of education.
3. Lack of legislation.

Has there been improvement in these particulars during the year just past?

As to lack of co-operation, I am sorry to report but little improvement. Why are there so few of the dairymen of the State at this meeting? It has been most thoroughly advertised both in the press and by circulars sent direct to managers of all the creameries and cheese factories of the State and to individual dairymen. This is a meeting held largely for the purpose of gathering dairymen together for mutual benefit, thorough discussion of dairy problems and exchange of ideas. But the attendance is not over one where there should be ten. Then, last winter, in connection with the effort to secure legislation, how little assistance, financial or otherwise, was given by the dairy and creamery men of the State. So little that opponents of the measure before the Legislature could make the point that it was not desired by many of

the dairymen; and but for the active co-operative aid rendered by the dealers in honest goods in St. Louis, we would have had no law preventing imitation goods sailing under false colors.

The securing of the enactment of the anti-oleo law was a matter of vital importance to the dairy industry of the State, and its proper enforcement will do much to revive and develop the business. How this is being done you will have heard from the Secretary of the State Board of Agriculture and his assistant, and with what results from Mr. Tivy.

The law is probably not all that the situation demands, and suggestions from those who have been in a position to observe its workings as to amendments, will probably be appreciated.

The Legislature was asked at the last session to appropriate $2000 to be used in developing the dairy industry of the State. The Committee on Appropriations acceded to the request and placed that amount in the bill, but it was afterward stricken out because of the $5000 that was appropriated to the Board of Agriculture for the enforcement of the anti-oleo law. This leaves the Dairy Association dependent for funds with which to carry on the work of developing and protecting the dairy industry upon limited resources. If we had the active assistance of all or one-half the butter and cheese factories and dairymen in the State, by their becoming members of the Dairy Association and paying the modest membership fee of $1 a year, the Association would have enough funds to enable it to do the dairy industry a vast amount of good, and which would result in a few years in making this one of the leading dairy States in the Union.

The second difficulty, lack of education, is gradually disappearing, and now that the management of the Missouri Agricultural College is making earnest efforts to do effective work in the direction of dairying, and with the co-operative assistance of the State Board of Agriculture, we may look for a speedy elimination of the greatest of all obstacles to progress—ignorance.

The third difficulty referred to, lack of legislation, has, as has been stated, been largely removed, and with results justifying the action.

The outlook, then, is much brigher than one year ago, and if during the year to come we can succeed in getting the dairymen of the State to assist in the work of developing and protecting their business, it will be but a few years till we cannot only say that Missouri is naturally the best dairy State in the Union, but is so in point of actual production, both in quantity and quality.

Respectfully submitted,

LEVI CHUBBUCK, Secretary.

TREASURER'S REPORT.

FINANCIAL STATEMENT FOR 1895.

RECEIPTS.		
Membership fees	$53 00	
Subscriptions from Concordia account 5th annual meeting	20 00	
" " Alma " " "	25 00	
" " Corder " " "	20 00	
" " W. J. Davis & Co. account of annual meeting	25 00	
" " Higginsville " " "	42 75	
Donation from C. Adams from premiums won	10 00	
Contribution by State Board of Agriculture	75 00	
Sales butter and cheese	41 60	
EXPENDITURES.		
Balance due treasurer from last statement		$28 19
Premiums paid out account 5th annual meeting		115 00
Paid C. W. Murtfeldt account attending meeting		20 00
Paid Dr. J. B. D. Worley account attending Chicago meeting '94		14 30
Paid printing bill for circulars and stationery		34 50
Paid D W. Wilson, express account		28 25
Paid printing fourth annual report		91 60
Paid postage, 500 cards, $5; 100 1c. stamps, $10; 250 2c. stamps, $5		20 00
Paid letter files (3) $1; pens, ink and other incidental, $1		2 00
Paid printing bill, for circulars, etc., 6th annual metting		28 10
Balance due Levi Chubbuck	69 59	
	381 94	381 94

Respectfully submitted,

LEVI CHUBBUCK, Treasurer.

Mr. Tivy moved that reports be accepted, and that a vote of thanks be extended to Mr. Chubbuck, Secretary-Treasurer, for the efficient manner in which he had conducted all the work.

Motion seconded by Mr. Smith, was carried.

Mr. Chubbuck—I thought it would be proper that a committee be appointed to examine the statement.

Mr. Tivy—The items are so few and so plainly drawn off that I do not think it necessary.

Mr. Shepherd—What remuneration has the Secretary, except the honor?

Mr. Tivy—He has just received a vote of thanks.

Mr. Shepherd—Our Secretary has done a great deal of work for the dairy interests of this State, and it seems to me that a vote of thanks, while that is all very well, is not all that he should receive. I think he should receive something more than a vote of thanks. I

move that a committee be appointed to agree upon what would be just compensation for the work he has done, and that he shall be paid for this work.

Mr. Tivy—Where will we get the money?

Mr. Shepherd—Where we get it for other things.

Mr. Tivy—I second the motion.

Mr. Chubbuck objected.

Mr. Chubbuck—There will be, after meeting the balance due me, a balance of $30 or $40 in the treasury above the accounts growing out of this meeting.

I would make the suggestion in regard to the remuneration of the Secretary, that it devolves upon him to raise the funds necessary to carry on the work. So if you vote this you will impose on him the burden of raising more money.

Mr. Shepard—He raises it for other things, why not for himself.

Mr. Tivy—It seems to me that the services he has rendered the Association are worth a great deal, and I make the motion that he be allowed $100, to be raised how it will; that is $100 a year.

Motion seconded by Mr. Harmon and carried.

Mr. Tivy—I do not think this will be pay for his services, but it will show him our appreciation of his services. I believe that when our next meeting comes we will have no difficulty in raising this money. If he has trusted us thus far he will certainly wait another year on us.

Mr. Chubbuck—Allow me to suggest that you have not yet elected a Secretary for the ensuing year. This $100 goes to the Secretary that is to be elected. There is money in the treasury that will pay what I have paid out. I think you had better let this matter of compensation remain until you have elected your Secretary for the next year.

Mr. Smith—I understood that it was for services rendered in the past. It has always been my idea that the Secretary holds over until another Secretary is elected, so that we have a Secretary now, and it looks to me that he should be paid for the services rendered.

Mr. Tivy—That was my idea, that he be paid for the services rendered up to the present.

Mr. Chubbuck—I object. I accepted the work, knowing the conditions, and undertook it under those conditions, and I don't want any pay for that. Whatever arrangements you may make for the future is all right.

Mr. Waters moved that the convention proceed with the election of officers. Motion seconded.

Mr. Dowell moved that a committee of three be appointed to report a list of officers.

Mr. Armstrong—I object to that motion; I want to say now that I want to nominate Mr. Dow for President. I make the motion that Mr. Dow be elected President.

Mr. Lamm—I would like to second that motion. I have known Mr. Dow for a long time. I know what he has done for our part of the country. He is a good parliamentarian, and in this work I believe the Association will find it to their advantage to have a parliamentarian like Mr. Dow as its President.

Mr. Tivy—I rise to make a nomination, an old gentleman advanced in years. I would nominate Mr. John Patterson who has served you so faithfully in the past.

Mr. Dow seconded Mr. Patterson's nomination,

Moved and seconded that nomination be closed.

Mr. Lamm—I received a letter from some one, I am not sure whether it was from Mr. Patterson or Mr. Rippey, stating that Mr. Patterson was old and did not always feel like attending, and asked to be relieved from the office. We should take that into consideration.

Mr. Tivy—Have you a letter from Mr. Patterson declining?

Mr. Lamm—I have either had a letter to that effect or one from Mr. Rippey.

Mr. Kennett moved that all officers be nominated and voted for at the same time. Seconded.

Mr. Dow—I am impressed with the idea that young people are sometimes desirable. I therefore nominate Mr. Rabius for the office of Vice-President.

Mr. Harmon nominated Mr. Allen, of Kidder.

Mr. Waters nominated Mr. Shepherd, of Columbia.

Mr. Tivy nominated Mr. Chubbuck as Secretary and Treasurer.

Mr. Hickel and Bergmann were appointed as tellers.

Mr. Tivy moved that a Second Vice-President be elected.

Mr. Lamm was nominated as Second Vice-President.

Vote was taken, and ballots were as follows:

President—Mr. Patterson, 13; Mr. Dow, 15.

Vice-president—Mr. Rabius, 10; Allen, —; Shepherd, 10.

Second Vice-President—Mr. Lamm, 14.

Secretary and Treasurer—Mr. Chubbuck, 26.

Being a tie for Vice-President, vote was taken over, Mr. Allen was dropped, and the vote stood: Mr. Shepherd, 17; Mr. Rabius, 9.

Secretary read a letter from Mr. Patterson expressing regret that, owing to an accident, he was prevented from attending.

A resolution expressing sympathy for Mr. Patterson was read and adopted.

A resolution commending the Agricultural College faculty for the promise of effective work was presented and adopted.

Mr. Hickel moved that vote of thanks be extended to Miss Maud Rippey, the stenographer of the convention. Carried.

Moved by Mr. Rice that the Secretary pay the stenographer the amount they may agree upon for services.

Mr. Kennett referred to the matter of paying the Secretary.

Mr. Smith—I think our minutes will show that we voted the Secretary $100 per year. It was a question with me whether we had a right to do this or not, but it seems to me that we can vote anything we have a mind to.

Mr. Lamm—I thought the collection of this money was laid over until the next meeting. I understand it we can vote anything we wish to contribute. I would like an expression on this question.

Mr. Rice—I think we should obligate ourselves to him for $100 per year, and that the stenographer be paid for her services. I make a motion to that effect.

Motion seconded and carried.

Mr. Chubbuck—Since preparing my financial statement, I received a contribution from Mr. J. J. Smith of $5. I believe he contributed $10 toward the expenses of the fight in the Legislature last winter.

Mr. Lamm spoke of the place of next meeting.

Mr. Chubbuck stated that he had letter from Appleton City requesting that next convention be held there.

Mr. Lamm stated that he had been requested to present the name of Mexico.

On motion, the convention adjourned *sine die.*

THIRD ANNUAL MEETING

OF THE

MISSOURI

SWINE BREEDERS' ASSOCIATION,

CO-OPERATING WITH STATE BOARD OF AGRICULTURE.

AT

COLUMBIA, MO., JANUARY 14, 15 AND 16, 1896.

EDITED BY J. BLAKE, EX-SECRETARY.

OFFICERS.

PRESIDENT—S. P. HARRIS.....Cooper county

VICE-PRESIDENTS.

C. G. SPARKS, of Saline county.....For the Poland-Chinas
W. N. BRISKY, of Jackson county.....For the Berkshires
J. C. CANADY, of Carroll county.....For the Chester Whites
W. L. ADDY, of Nodaway county.....For the Duroc Jerseys
A. G. McCLELLAND, of Adair county.....For the Victorias
J. M. KENNEDY, of Livingston county.....For the Yorkshires

SECRETARY—JAS. P. BLAKE.....St. Louis
TREASURER—H. C. SYDNOR.....Lafayette county

EXECUTIVE COMMITTEE.

C. C. ALLEXANDER.....Callaway county
GEO. P. BELLOWS.....Jackson county
LEVI CHUBBUCK.....Caldwell county; and the President and Secretary

PROGRAMME.

JANUARY 14—TUESDAY, 7:30 P. M.

1. Invocation ..... ——
2. Address of welcome.....Dr. R. H. Jesse
   (President of the University of Missouri.)
3. Response .....Hon. Norman J. Colman
   (Ex-United States Secretary of Agriculture)
4. Some of the Mistakes Being Made by Breeders....Hon. J. M. Welsh, Laclede
5. How to Get Rid of Hog Cholera.....S. Y. Thornton, Blackwater
6. The University Glee Club.
7. My Kind of Hog Fence.....J. M. Vivion, McCredie

JANUARY 15—WEDNESDAY, 9 A. M.

Score Card Practice by Messrs. Geo. P. Bellows and C. G. Sparks.

8. President's Address .....S. P. Harris, LaMine
9. When to Commence and How to Feed for the Show Ring..J. S. Risk, Weston
10. Cooked Food versus Raw Food.....N. H. Gentry, Sedalia
11. In-and-In Breeding versus Cross Breeding.....D. D. Smothers, Armstrong
12. Dairying and Swine Breeding.....Hon. H. H. Armstrong, Clinton

JANUARY 15—AFTERNOON SESSION, 1:30 P. M.

13. My Opinion of the Hog House.....J. A. Maxwell, Fayette
14. Cheapest Hog Food.....A. Allen, Kidder
15. How Many Acres for Ten Sows and Progeny.....J. E. Summers, Huntsville
16. The Advantages of Public Sales.....H. C. Sydnor, Corder
17. What Causes Rheumatism and What to do for it.....Ed. Dorsey, Perry, Ill

JANUARY 15—EVENING SESSION, 7:30 P. M.

18. Results of Some Experiments in Swine Feeding.....Prof. H. J. Waters
    (Dean of the Agricultural College).
19. The Pure Bred Hog as a Factor in Profitable Pork Production.....
    .....W. L. Addy, Parnell
20. The University Mandolin Club.
21. Thoughts and Observations Concerning the Selling of Pure Bred Hogs at
    Public Sale..... Col. Jas. W. Sparks, Marhall
22. The Most Profitable Age at Which to Sell a Hog as Porker or Breeder...
    .....Col. M. B. W. Harmon, Pickering
23. The University Banjo Club.

JANUARY 16—THURSDAY, 9 A. M.

24. The Swine Industry of Missouri.....Hon. J. R. Rippey (Secretary State Board of Agriculture).
25. Proper Age for Mating.....S. A. Chitwood, Rocheport
26. One or two Litters a Year.....S. W. Cox, South Greenfield
27. The Breeder's Private Herd Record and Best Method of Marking Litters.....F. M. Lail, Marshall
28. What I Think of the Score Card.....Geo. P. Bellows, Kansas City
29. Inflamation of the Udder.....E. G. McComas, Sturgeon
30. Thumps and its Treatment.....J. C. Canaday, Bogard

JANUARY 16—THURSDAY, 1:30 P. M.—BUSINESS SESSION.

Reception of new members and payment of annual dues.
Reading of minutes of last meeting.
Reports of committees.
Report of Executive Committee.
Report of Secretary.
Report of Treasurer.
Unfinished business.
Election of officers.
New business.
General discussion.
Adjournment.

By order of the Executive Committee:

S. P. HARRIS, LEVI CHUBBUCK, GEO. P. BELLOWS,
C. C. ALEXANDER, JAS. P. BLAKE.

December 28, 1895.

PROCEEDINGS.

The Third Annual Session of the Missouri Swine Breeders' Association was called to order by the President S. P. Harris, of Cooper county, at Columbia, on Tuesday, Janurary 14. In a brief address he introduced Dr. R. H. Jesse, President of the Missouri State University, who delivered an address of welcome. Dr. Jesse traced the popular opposition to the hog from ancient times, and emphasized the sympathy felt for this industry by the Department of Agriculture of the State University. In the face of many difficulties this department has been brought into a position where much practical information is furnished to those engaged in agricultural pursuits. Since April, 1895, $10,500 has been expended in this department, and $65,000 during the past four years.

Hon. Norman J. Colman, ex-Governor, and the first Secretary of Agriculture under Mr. Cleveland's first administration, responded to the address of Dr. Jesse. Governor Colman is the oldest swine breeder in the State, and his address was filled with much practical information. It will be remembered that during his term of office the active steps were taken by this government toward the thorough inspection of all live-stock intended for export, and investigations pursued, which resulted in virtually stamping out pleuro-pneumonia among cattle, and threw much additional light upon the causes and remedies for diseases in hogs.

In the absence of Hon. J. M. Welsh, of Laclede, his excellent paper upon the subject "Some of the Mistakes that are Being Made by Breeders" was read by Jas. P. Blake, of St. Louis, Secretary of the Association. Mr. Welsh recognized the delicate position occupied by anyone speaking upon such a subject, since it assumed in advance that breeders make mistakes.

Among other good things, he said: "No one is warranted in the defense of any method before the public or an association simply because it may be of personal benefit to himself while it is detrimental to the community or association. Every breeder is put upon his honor,

so the utmost of care and honesty should at all times characterize every representation."

Mr. S. Y. Thornton, of Blackwater, read a paper, short but to the point, on the subject "How to get rid of Hog Cholera." Three ways were mentioned.

First—Like a friend got rid of a crop of artichokes, "he got rid of them by selling the farm."

Second—By rushing the pigs off to market, both wrong and dishonorable.

Third—By separation of the infected from the rest of the herd, change of ground and free use of disinfectants. Those badly infected should be killed and the carcasses burned.

A full and instructive discussion followed the reading of this paper. Among other things, it was developed that the germs of hog cholera could be carried from place to place upon wagon wheels, clothing and by other animals. The disinfectants commonly used are carbolic acid, lime, etc. Dr. Connoway corrected the impression that the germ of cholera was in every animal, and only needed certain conditions for its development. In answer to an inquiry concerning burying the dead animals, Dr. Connoway referred to the investigations of the great French scientist, Pasteur, which showed that the germs of disease were spread by the grass growing over the grave. The disease is caused from a seed, just the same as the planting of wheat or oats. The time between exposure and death may be several weeks, but in experiments conducted where the germs were infused into the blood death resulted in from 36 to 48 hours. The method of charring the dead bodies and permitting the living herd to eat of same is too crude a method and fraught with too much danger, as the germs may not be distroyed, and instead of immuring the hog, may result in its death. In his opinion no reliable remedy for hog cholera has yet been discovered. The best way of killing the germs is the use of lime as a disinfectant.

Mr. J. F. Waters called attention to one of our State laws prohibiting, under the penalty of a fifty dollar fine, the hauling of diseased or dead hogs through the streets, but which had fallen into disuse. Many make a business of burying dead hogs, and in one instance he cited cholera was introduced into a herd by this means which resulted in the loss of some $700 or $800.

Mr. S. P. Harris, President of the Association, in his address, recommended that the State Legislature be asked for an appropriation of $2500 to further prosecute the work of the Missouri Swine Breeders' Association.

"In and in Breeding versus Cross Breeding" was discussed in a well prepared paper by D. D. Smothers, of Armstrong. There was quite a difference of opinion manifested by the breeders in the general discussion following, but the general sentiment was that there should be held in view some definite object, and that form of breeding pursued which would realize the highest type.

"My Opinion of the Hog House" was the subject assigned to Mr. J. A. Maxwell, of Fayette, and he handled the subject in a thorough manner. He styled the lowly beast as "the greatest mortgage raiser on the farm," and argued for the best possible shelter. One essential of this is that it exclude the cold winds and drafts. By utilizing the fodder and straw that would otherwise go to waste, this would prove one of the best investments to be made, even on a rented farm. As to the style of house, preference of a board or dirt floor, there was again noticeable quite a difference of opinion. The main objection to the dirt floor was that it would get dusty and prove very injurious to the hogs. The general opinion was in favor of movable houses, capable of being easily cleaned, built so that there could be plenty of sunlight at all times. Mr. Sydnor, of Corder, suggested a hinged floor, so that by raising it could be easily cleaned, and the planks beveled toward the crack of the floor, so that no water would remain in the house.

Mr. A. Allen, of Kidder, in his paper, recommended as the "Cheapest Hog Food" a combination food consisting of corn and grass, clover preferred, for summer, and corn, oats and oil feed the best for the winter. No feed can take the place of corn as a part feed at any time of the year.

J. R. Rippey, Secretary of the State Board of Agriculture, read a most excellent paper upon the subject, "The Swine Industry of Missouri." He dwelt upon the general distribution of this industry among the farmers in every section of the State. In 1894 two and a half millions hogs were shipped out of this State and probably one and one-half millions more retained on the farms, making a total hog production for the State in 1894 of four million head, worth thirty-two million dollars. In 1895 the total receipts of the Chicago market were approximately 8,000,000 head, and with the natural advantages of Missouri for raising food for the hog, it is possible to supply a number equal to that sold in this great market.

Estimates for this State for 1895 place the loss from cholera at 12 per cent of all the swine in the State, or approximately 480,000 hogs, worth four millions dollars. No cure for this disease has yet been discovered by science. Injudicious feeding, breeding and want of care

and sanitary regulations furnish royal quarters for disease and invite occupation. With good sanitary regulations, pure water and a properly balanced food ration and vigorous animals, but little fear need be entertained from these destructive plagues. The best hog is the one that will produce the most meat at the least cost now, but it is possible that in the near future the quality of meat may be considered to such an extent as to change this.

Speaking of improved breeds, Mr. Rippey said that we were well supplied with the foundation stock for this advanced movement. In conclusion, he said: "For improvement in Missouri swine, for advancement in this industry and the solution of problems connected with it, for an increase in its millions of revenue and for honors to be won in competition with the future exhibits of the world, we depend upon you men, with assurance from the past that our confidence is not misplaced."

Mr. Bruns suggested that milk was the best and cheapest feed, but this did not seem to be the general opinion of those present.

Mr. Canaday advocated the use of oats, corn-meal, bran and shipstuffs boiled in a steamer in the following proportion: One-half or more whole oats, one-quarter ground corn and the rest bran or shipstuffs.

Mr. J. E. Summers, of Huntsville, read a paper upon the subject of "How Many Acres for Ten Sows and Progeny." Estimating six pigs in each litter or seventy in the entire herd, he considered fifteen acres of pasture and fifteen acres for corn or small grain and roots sufficient to support this number from the time of farrowing until they are nice, well-rounded fat hogs, large enough to fill a barrel at ten months old.

The subject assigned to Mr. H. C. Sydnor, Corder, was "The Advantages of Public Sales."

Drawing upon his own experience during the past years, Mr. Sydnor advocated the holding of public sales. His arguments were that the money thus received came in a lump and could be used to better advantage; the pigs sold would not be left on one's hands until the following spring, as is frequently the case in private sales; a better advertisement for the breeders, and this system gives the prospective purchaser a chance to see the entire herd. He also advocated vigorous advertising of each sale.

In the general discussion following, the unanimous sentiment seemed to favor this manner of sale, but it was emphasized that the knife should be freely used before the day of sale, and all inferior animals culled from the herd. A better feeling and wider acquaintance

is cultivated among the breeders, was another argument advanced in support of this method.

Mr. E. R. Dorsey, of Perry, Illinois, was compelled to be absent, but his paper upon "What Causes Rheumatism and What to do for it" was read before the Association. The causes of rheumatism may be grouped under two heads, the indwelling and the exciting or direct cause. Under the former may be mentioned inbreeding or close breeding, which weakens the constitution; under the latter, exposure to the cold and dampness, undue confinement, want of cleanliness, imperfect ventilation, sudden change of temperature, especially when accompanied by excess of moisture in the atmosphere and poor shelter. It also follows other diseases, such as influenza, colds, quinzy, inflamation of the lungs and cholera. One of the first symptoms is lameness, which developes suddenly and may shift from one part of the body to another if the muscles are affected. The hog is inclined to lie down most of the time. When it arises from exposure to cold or wet, it frequently affects the loins or shoulders, and is often called kidney worm if affected in the loin. The treatment may be classed as curative and preventive. The former, a good dry house, good feed, such as bran mash, little oil meal mixed, put in five drops of the tincture of bryonia, mixed, and feed two or three times a day. As a preventive, pay particular attention to the selecting of strong breeding animals, and avoid breeding sows that have been affected; provide good shelter, with plenty of room for exercise; observe cleanliness, ventilation and location of sleeping quarters. Do not build houses in low, flat places.

Mr. Sydnor and others advocated bleeding or marking, while some have tried steaming with good results. The latter is done by wrapping in a hot blanket. All insisted upon plenty of good exercise.

"The Breeder's Private Herd Record and Best Method of Marking Litters," by F. M. Lail, Marshall. This was an excellent address by a man of experience and observation who evidently knows the necessity of accuracy when pedigrees are matters of value, and value is assured only by absolute confidence in the certainty of the correctness of the pedigree. Mr. Lail established this fact to a certainty. He uses the No. 5 steel spring punch, marks his pigs in the ear when 10 to 14 days old; records the number of pigs in the litter, number of males and of females, and the ear marks by which the litter is known. If then the owner should be absent from home, or confined to his bed, or, indeed, dead, anyone with the private record before him and the pig, can, without further assistance, determine the litter and its breeding beyond peradventure. The address was eminently practical, and will

be found worthy of a careful perusal, and the system advocated put into general practice.

Col. James W. Sparks, of Marshall, read a paper entitled "Thoughts and Observations Concerning the Selling of Pure Bred Hogs at Public Sale." One of the first steps to insure a successful sale is in the selection of the best animals possible at breeding time. A thorough culling out of the inferior animals before the day of sale will insure better prices. The breeder's motto should be "quality before quantity." This should be followed by judicious advertising by bills and in the papers.

"The Most Profitable Age at Which to Sell a hog as Porker or Breeder" was discussed by Col. M. B. W. Harman of Pickering. The best time to sell for breeding is when six to eight weeks old.

In the discussion following, the general opinion was against keeping a hog until he weighed 400 pounds, except in special circumstances. The best weight, providing the market is then suitable, is from 180 to 225 pounds.

"Proper Age for Mating" was ably discussed by Mr. S. A. Chitwood, of Rocheport. Too early breeding stunts the growth and prevents proper development of the frame. It also temporarily lessens the vitality of the animal. The boar should be at least six or eight months old. A young sow never should be bred under 12 months, and only then when she is to farrow in the spring. If in the fall, then not under 15 months old.

Mr. S. W. Cox, of Greenfield, had prepared a paper upon the subject "One or Two Litters a Year," but was compelled to be absent. In this paper he advocated, with proper attention, two litters a year.

Mr. George P. Bellows, of Maryville, spoke upon "What I Think of the Score Card." He considered it essential for the successful breeder to know all the points and their relative value which combine to make a typical individual of the most perfect of the breed, and advocated the use of the score card to this end. It is not the experienced and practical judge that needs the score card so much as the beginner who is laying the foundation for future success. Therefore, I think it has enough of virtue as an educator and guide to be worthy our further consideration.

In a brief paper Mr. Canaday, of Bogard, discussed "Thumps, and Its Treatment."

Prof. H. J. Waters, Dean of the Agricultural College, gave the "Results of Some Experiments in Swine Feeding," illustrating his lecture by black-board hints.

The afternoon was spent on the State farm, where the diseases of hogs and effects on the different organs were discussed.

The business meeting was full of interest. A committee had been appointed at the last meeting to secure legislation against freight and express companies for the detention of stock along their lines. Consultation with the Railroad and Warehouse Commissioners disclosed the fact that there is a State law relating to the subject.

Minutes of last annual meeting were read and approved.

The report of the Auditing Committee was accepted.

Report of the Secretary embodying the report of the Treasurer was read. Financial statement showed a balance at the beginning of 1895 of $40.70. A $50 contribution from the State Board of Agriculture and 33 paid memberships in January, 44 memberships in May and others during the year swelled the receipts for 1895 to $170.70. Total disbursements for the year were $27.75, leaving a balance prior to this meeting of $142.95. At this meeting 66 members having paid the annual dues, the treasury now contains $208.95. The report was accepted.

The election of officers then took place: President, L. L. Frost, Mirabile. Vice-Presidents were selected as follows by acclamation: O. D. Keister, Chillicothe, for the Poland-Chinas; S. Y. Thornton, of Blackwater, for the Duroc Jerseys; June R. King, of Marshall, for the Berkshires; D. D. Smothers, of Armstrong, for the Chester Whites; J. T. Nunnelly, of Fulton, for the Victorias.

Mr. J. P. Blake declined to serve as Secretary during 1896 and Mr. George P. Bellows was nominated and unanimously elected, and in a few words urged the members to assist in the work for the coming year. The Treasurer, H. C. Sydnor, was re-elected.

Executive Committee—F. M. Lail, John M. Vivion, J. A. Maxwell and the President and Secretary.

It was moved and carried that the Association hold a hog sale. Each member may bring two hogs and no more to be sold at the next annual meeting. It was moved and carried that a committee have entire charge of the coming sale; that the exhibitors who bring stock should bear the expense pro rata for advertising, catalogues, etc. The committee is J. F. Waters, J. W. Sparks and G. W. Null.

Gentlemen of the Missouri Swine Breeders' Association—Your Committee on Resolutions beg leave to present the following:

Resolved, That we desire to return our sincere thanks to President Jesse, of the State University, for his cordial welcome and reception of the Missouri Swine Breeders' Association, both collectively and individually. We feel that in his executive ability and genial sympathy we will always have a friend in whom we can safely intrust our interest.

To Prof. H. J. Waters, Dean of the Agricultural College, for his enthusiastic and genial sympathy extended to each and every individual of our Asso-

ciation. In him we have a leader worthy of our grand State and all of her agricultural interests; to him we not only extend our heartfelt thanks, but pledge him our most loyal support in making Missouri Agricultural College and Missouri agricultural interests the very foremost in the Missouri valley.

To the State Board of Agriculture for the generous co-operation and substantial support they have given the Association.

To Col. J. R. Rippey, Secretary Missouri State Board of Agriculture, for his energetic and active sympathy in the objects of our Association.

To the citizens generally of Columbia for their cordial and genial hospitality while in their midst as their guests.

To the Faculty, Profs. Mumford and Connoway, for their interest and valuable instructions which they have given the meetings.

That we indorse the short course in Agriculture as conducted at the Experiment Station as being in the hands of earnest, competent and, above all, practical men, which work we think promises to be of great value to the farmers of the State.

Resolved, That we enter our most earnest protest against the delay in the publication of the annual report of this Association. We believe the State Board of Agriculture has done everything in its power to have this report out in good season, and that the fault is with the State Printer, who held the manuscript from May to the last of December.

Resolved, That a copy of these resolutions be furnished the Secretary of the State Board of Agriculture, the Commissioners of Public Printing, and that the matter be referred to our committee on legislation.

Respectfully submitted,

M. B. W. HARMAN,
H. C. SYDNOR,
GEO. P. BELLOWS.

The following resolutions in respect of the memory of the late A. J. Blake, were unanimously adopted:

Whereas, It has pleased Divine Providence to remove by death from our midst and his post of duty, our genial, earnest and whole-souled brother, A. J. Blake, late Secretary of this Association; and

Whereas, He was endeared to his legion of friends by his genial and gentlemanly personal bearing, untiring zeal and unselfish devotion in promoting the gospel of improved swine, poultry and dairying; and

Whereas, He was the father and enthusiastic promoter of the Missouri State Swine Breeders' Association, he believing that through such an association there could be inaugurated a new era of personal good feeling and co-operative spirit among those engaged in this, the most important industry in our grand State, and thus advance and place our Missouri swine interests foremost among the states of the Mississippi valley, therefore be it

Resolved, By this Association in annual session at Columbia, Mo., that we humbly bow to the Divine command of Him who has said "Well done, thou good and faithful servant, come up higher," and while we all mourn the loss of the "noblest Roman of them all," yet we are comforted by the memory of our esteemed brother, promoter and co-worker, in the belief that his efforts will ever stand as a monument to his ability and zeal, and we are further comforted in the hope that he has gained his reward in heaven. And be it further

Resolved, That a copy of these resolutions be forwarded to the family of the deceased and to each of the Agricultural papers of the State, also that a page of the records of this Association be set apart for the recording of these resolutions.

H. C. SYDNOR,
M. B. W. HARMAN,
GEO. P. BELLOWS.

PRESIDENT'S ADDRESS.

By S. P. Harris, of Lamine, Mo., to the annual meeting of the State Swine Breeders' Association.

Gentlemen of the Swine Breeders' Association: It affords me great pleasure to give you a cordial greeting on the occasion of your coming together in this beautiful city of churches and schools for the purpose of considering and promoting the important industry which this Association represents. I am truly glad to see before me so many intelligent gentlemen interested in the breeding of swine.

I presume, fellow-breeders, you have left your herds well provided with proper feed and attention, while you spend a holiday in the society of your brother-breeders. And I believe, gentlemen, that you are proud of the success of our organization in the past two years, and the bright outlook for the future.

Our most sanguine members could not hope for the phenomenal growth our Association has attained in so short a time. We have no places of profit or great honor in our organization; no place that ambitious politicians could use as a step for something higher; therefore, we are deprived of that influence which has been detrimental to so many organizations and enterprises.

The social feature of our meeting is assured, as the past meetings of the Association have proven. You have proven yourselves one of the most progressive swine breeding associations in the United States.

I do not believe, fellow-breeders, that any branch of the stock-raising business or of farming exceeds in importance that of the raising of swine. When everything else produced on the ranch or the farm is the least profitable the porker comes to the front, and though even it may be low in price, still does much to tide over depressing times and bring money to the pocket of the intelligent and careful breeder. The hog, especially in the last three or four years, has been an important factor in the affairs of the country. Fortunes are made by the slaughters of the animal, and every household in the land, be it grand or lowly, finds a use for at least some portion or some product of the hog, and though at times the breeder may find the business inclined to languish and become less profitable, he should not be dis-

couraged, though it may be prudent for him to sail close to the shore; and at such times he never neglects his business and jumps to something else that may be on the boom, for booms do not last, while the hog is always in demand at some price.

In times of depression the wise breeder will continue the even tenor of his way, and improve his herd, feeling sure that the clouds of depression will pass away. When there is no great demand for pigs, the breeder leaves them to grow and develop on his premises, and can then select from his herd the most desirable, to be kept for breeding purposes.

We are favored with a climate very favorable to the raising of swine, and with a soil that produces in abundance and in great variety the foods most desirable for them; and while the industry has already reached a position of great importance in our State, we may confidently look forward to the day, not far off, when the great State of Missouri, first in so many grand and glorious things, will be also first in the very important industry, the promotion of which has brought us together today.

There should be no backward steps taken, but let every member present endeavor to suggest something of interest to the Association, and with the determination to succeed, which is characteristic of the intelligent farmer and breeder of Missouri, and filled with commendable ambition that strives for honest success, we can and will make rapid strides toward the advancement of our cause and calling.

The breeding of the hog is a business in which every man, woman and child in the State is directly or indirectly interested, and in view of the vast importance of the industry, the State might, with profit and propriety, make an appropriation for the advancement of the industry.

The State Horticultural Society receives $2500 a year from the State treasury, and though at least as much might with profit to the State at large be given to this Association to aid in its objects, we would be glad to receive one-half that amount, and could assure the powers that be that any assistance rendered us would be used wisely and for legitimate purposes. I am not prepared to say how much revenue the State receives from the swine industry, but if all such property were stricken from the assessors' books for one year a large deficit would be found in the revenue, and the State might be willing to appropriate all the money we need for the advancement of the objects of this Association.

It is needless for me to say, fellow-breeders, that you are benefactors of mankind, and as such you ask recognition from the State.

You have developed the hog of our grandfathers up to the improved porker of today, and the improvement made has required considerable study, time and money.

But I am occupying too much of the Association's time, and will close by expressing the hope and expectation that you will aid your chairman in the discharge of his duties, that nothing may happen to mar the pleasure of our coming together, and that our meeting may be pleasant and profitable.

SOME OF THE MISTAKES MADE BY BREEDERS.

An address by Hon. J. M. Welsh, Linn county, Mo., before the State Swine Breeders at Columbia, January, 1896.

We do not generally manifest any very high appreciation of criticisms upon our methods of conducting our business, and while we may be willing to accept any reasonable suggestions in the matter of improvement, we are seldom anxious to be reminded of mistakes. The subject, "Some of the Mistakes Being Made by Breeders," which has been assigned to me by your committee, assumes that we do make mistakes. The fact that most mistakes are the result of honest conclusions, makes it necessary to discuss the subject with candor and courtesy, while we cannot avoid running counter to the views and methods, perhaps, of our friends.

There is, however, one acknowledged principle which all should recognize. It is that no one is warranted in the defense of any method before the public, or an association, simply because it may be of personal benefit to himself, while it is detrimental to the community or association.

We all do things which we would not do if we knew better. Some things we do against our judgment, because we are influenced by demand or custom. Mistakes are always harmful, and the results of some mistakes may amount to wrong doing, or even fraud. Not that the individual intends to commit a fraud for the purpose of harming anyone, but because he makes the mistake of believing the thing done is necessary to his success in representing, selling or exhibiting his stock. Fortunately we believe few breeders are tempted into the commission of such mistakes.

The breeding and distribution of pure-bred swine is of such vast importance, and every breeder is put so much upon his honor, that the utmost care and honesty of purpose should at all times be maintained, so that every representation, pedigree and award is an honorable certificate.

Mistakes occur in correspondence; sometimes in the manner and sometimes in the matter of the correspondence, that are often charged as criminal because harm results.

Breeders are not always possessed of the strictest judgment as to the merits of their own stock. Hence representations are made which from the standpoint and judgment of the writer may seem correct, while the impressions conveyed are not warranted by the facts.

It is not best to answer an inquiry by saying you have a pig that is good all over, unless you are a critical judge of all points even of your own stock, and know just what you may be held responsible for. As the word "good" does not suggest any definite degree of quality, it may mislead, and at best it calls for a test of the buyer's knowledge, or estimate of your judgment. It is, perhaps, better to use it as a finale to a complete description. However, if you have a good animal, say so. Every breeder has a right, in his inquiry for stock, to describe in detail the kind of an animal he desires. The seller has a right, and, in fact, it is his duty, to describe the animal he offers to sell on order.

Then responsibility rests chiefly where it should—upon the man who has seen the animal, and he has fulfilled his agreement when he fills the description. It is a mistake when a breeder, in his inquiry for a pig, describes in detail the particular kind of an animal he wishes, to answer him in an irritable, discourteous, unbussiness-like manner, charging his inquiry with being peculiar, just because he cannot furnish it. It is just possible that the buyer knows his business, and, besides, he will understand us better, and respect us more, if we frankly reply that we do not have it at present. It is a mistake to ship an animal on the lone description of the wants of the buyer, and we would not buy an animal on order without a description from the seller. In some localities, owing to competition, as well as meager sales, breeders have been induced to offer to ship all animals subject to the pleasure and acceptance of the buyer. Believing that all who give this matter careful thought will at once see the error of inaugurating a system which rests all responsibility and risk of shipping, mistaken judgment and business honor of the buyer upon the shipper, it is enough to state the fact. There doubtless are individual cases where it is altogether proper, but as a common method of disposing of stock, breeders will do well to avoid it. It is right, however, to follow up every sale, and to know that it is satisfactory within the spirit as well as the letter of the contract.

It is a mistake for a breeder to make inquiry by letter for an animal without stating that he is a breeder, and giving some idea of the class or quality he desires, so that the seller can particularize as to some

points considered essential by breeders, but not especially so by farmers. For, while there may not be much, if any, difference in the value of the animal for general purposes on the farm, there may be a difference in points of style and finish, making a difference in value and price to the breeder.

It is desirable and right for every breeder to endeavor to obtain prices for all animals of thorough breeding and good quality that will remunerate him for his trouble, expense and skill as a breeder no matter to whom he sells. Very few animals of selling age should be sold at such prices as $8, $10 and $12. These are not the prices for improved breeding and quality under ordinary circumstances. There is a disposition on the part of farmers in some localities to refuse to pay a proper price for improved breeding stock, because they have acquired the habit of rating everything of the kind by the pound, and of making little allowance for any expense beyond that of feed and none for the skill of the breeder. In such instances the exhibition of some spinal column has a good effect. Set the price just and quickly, and in a courteous manner stand by it. If he buys, furnish him a good animal that will improve his herd, and give him the pedigree to which he is entitled.

If the neighboring breeders are trying to sell at half-scrub prices, it may prove some annoyance at first, but it need not prevent the sale of good stock at fair prices. There is room above the ideas, and the quality of the stock of the breeder who is pleased with prices little above the market. Enlarge your facilities by improving your herd, and by judicious advertising. Stand by just prices and good stock; ask no more than the animal is worth and take no less. Better by far to send it to Chicago. The success of this method of education is surprising. The farmer soon recognizes your character as a breeder and business man; so that he is ready to harmonize his views with your judgment as to the value of improved stock.

I am aware that there are circumstances peculiar to the time being that may render it necessary to make some sacrifice.

What we have said applies more especially to transactions of breeders with each other and with the public.

The breeding of pure-bred swine, like most other business, is beset with influences that in many instances not only cause discouragement and loss, but also retard improvement. Many breeders, and especially those of less experience, realizing the necessity of getting to the front by the shortest possible route, become the victims of popular fads.

There are men with an eye to business, who understand improving opportunities. They recognize the power of the press, and under-

stand human nature. They buy an animal with some reputation, and soon give it more. It is possible to advertise it as the "thousand-dollar hog," and that settles it. The papers are full of it. Breeders talk about the thousand-dollar hog, and why not?

A boom is created, and the thing becomes a fad. The "gadderenes" are all stirred up. All want thousand-dollar hogs. The demand becomes intense and wild. To get into the swim is the craze. Build, style, excellence and pedigree don't count unless it is of the fad. The fad will go, though short in merit. Men look at their own breeding. It looks tame; only perfection, success and such like. Splendid for build, quality and color, and getting better; but not in demand, except by sticklers for merit, and by farmers and feeders. It is the fad they need and must have to put them to the front. It spreads over the country like swine plague. Experienced breeders, taking just a little of it as a side issue, to test it, and to be in the swim. The younger breeder sees this, and must have it; the more the better. Discarding, perhaps, a well-begun foundation, he buys another with little heed to the animal if its name is fad. He breeds all of his sows to the new acquisition and blows his horn for the general boom. Not quite satisfied with the narrow shoulders and hams, and would prefer fewer white ears, and a little more black on one side of the head, and the eyes set distinctly apart; but the thousand-dollar hog which the other fellow has will cover a multitude of sins, and it is all the go. He concludes, however, that his sows are at fault, so he sells his sows and selects from these thousand-dollar gilts, and now he has a fashionable herd. Yes, and nobody wants them. The farmers don't like them, and he has not been selling much to the breeder trade, and even if he has, the spell is off. I wish to be understood. I do not object to investigating or testing anything under any name, if it possesses merit enough to attract attention, but it is a sad mistake for breeders to allow themselves to be led into a craze.

The most successful breeders are among those who carefully select a beginning with excellence as their motto, and never allow a fad or a fancy to spoil the results of their very best judgment.

It is some satisfaction, besides the pay there is in it, to have brought up a herd noted for its uniform excellence, and always growing better, so that when a buyer or visitor comes, you can with pride show him through your herd and have the satisfaction of seeing him open his eyes. There are lines of breeding that seem to reproduce themselves when carefully managed and mated, and should and do improve in the hands of the skillful breeder. A successful breeder should be able in the course of his breeding to produce better animals

than he buys. But this cannot be accomplished by the breeder who allows himself to run after fads and booms, that are often the result of shrewd business tactics rather than great merit.

This argues nothing against pedigree tracing on every side through the very best blood, or even to the highest-priced animals.

The trouble lies in the tendency to yield all things to the demands of the craze, ignoring experience and good judgment. The most successful breeders will tell us that the improvement in their herds is the result of strict adherence to the laws of breeding for excellence, avoiding everything, no matter what its name or reputation, which does not possess excellent inherited quality.

We are all aware of the influence of a thoroughly bred sire upon the herd; and yet it is a mistake to expect satisfactory results in breeding unless the sows of the herd are bred to a point where form, color and potency become fixtures.

The absence of uniformity in form and color in a herd may be set down as an indication of indiscriminate and faulty breeding.

There is a tendency on the part of breeders in some localities toward a hog lacking in range and substance sufficient to produce the desired weight at a given age. This is due, perhaps, to the erroneous idea that a hog with much size must be a rough animal. Also to the fact that the market demand is not for heavyweights.

Hogs of rapid growth are usually of good size at maturity, and if properly bred they are readily prepared for market at any age. The swine breeders of Missouri have, as a rule, maintained better growth and size than is found in some states where extreme demand prevails for particular finish in externals, regardless, to some extent, of real quality. There cannot be too much style and finish, if we are sure we know what they should consist of. We are mistaken if we conclude that we have succeeded when we have simply produced diminutive ears and snub noses at the expense of size and spread, with proper scale or proportion. Breeds of swine are usually the result of carefully blending the characteristics of animals of different size, build and finish; so that to maintain the most desirable features obtained by these crosses, it is necessary to observe the law of proper mediums in mere externals, while we should breed strongly for points of real excellence. It is true that these external features indicate the tendency of our breeding as to the more essential qualities.

INBREEDING.

An address to the Swine Breeders of Missouri, in annual meeting, by D. D. Smothers, Armstrong, Mo.

Gentlemen and Brother Swine Breeders: It is with regret that I am not prepared to give you an interesting paper on inbreeding swine; but, if you will pardon me, I will endeavor to give you what I have found to be true in inbreeding swine.

In the first place inbreeding is too important a thing for an inexperienced hand to engage in, as it has often proven to be more of a disadvantage than of an advantage. It has a tendency to lessen the bone and decrease the growth of your hogs. I have found in my experience that it does not give satisfaction when it is kept up through the same families. It has a tendency to destroy the thriftiness of hogs and I have observed that it has a tendency to diminish the bone and increase the coarseness of the hair, and where it is kept up through several generations you will have nothing left in your herd but a lot of small-boned and coarse-haired hogs that will require twelve months to get ready for the market at an average of 200 pounds each.

And cross-breeding has been found advantageous in producing prize-winning hogs. If we trace the records of the leading fat show hogs we will find many of them cross-bred. Many have concluded that cross-breeding is an excellent thing, and many a man has practiced it to his sorrow. The results from cross-breeding are sometimes an improvement, but often a failure, and sure to be when practiced by an unskilled man, and failure will sometimes occur under any system of management, and the average hog man cannot afford to practice what is likely to be a failure. The get of two thoroughbred hogs is not as valuable as their ancestors. When pure or full blood hogs cease to be of no more value than the price they will bring on the market they have not been handled properly. Pure bred hogs will always be of more value than their cross descendants, and the average hog man cannot afford to breed cross breeds. When pure blood females have once been cross-bred we are not certain that they will ever breed true to type again; they may and they may not. Cross-breeding cannot be practiced by the average hog man, for the scarcity of the material to use, as the pure blood hogs are but a drop in the bucket compared with common hogs. Bear in mind that the pure-blooded hogs are very scarce compared with the common hogs.

Let it be borne in mind at the same time that cross-breeding is not the thing for the common hog man to engage in.

THE HOG HOUSE.

By J. A. Maxwell, Fayette, Howard county.

Mr. Chairman and Brother Breeders: It has been assigned to me to give my opinion of the hog house. I do not know why it is that the hogs on the farm are the last stock that comes in for attention in the way of comfortable quarters. Some effort is made to shelter the horse, also cow that keeps the family in milk and butter; but the hog that fills the lard and pork barrels has no comfortable shelter. The majority of farmers hardly stop to recognize the hog as the best mortgage raiser on the farm. Beyond question, the hog has released more mortgages off Missouri farms than any other stock. And why not give him as comfortable quarters? In my experience I wasn't long in learning what the hog wanted in the way of shelter. As I haven't lived as long as some I know that have had a great many more years of experience, yet I see I have not learned all yet.

Most certainly it need not be a costly affair. Any one that can own a pig can shelter him comfortably. I can remember how the hogs used to render the night hideous by their cries when struggling to keep warm. It is a sound not yet unknown on many farms today. I would that I could impress it on every farmer that these cries and struggles are strong pulls on the purse strings. Not until they realize this will they push every effort to shelter them. An inexpensive shelter may be as comfortable as the pigs want in the coldest weather. When they are exposed to storms, or even a draft, we must feed against the waste of system thus caused. It makes no difference what kind of a structure you have if it does not exclude the driving blasts of wind it is a failure as a shelter for swine as well as any other stock.

I have found when they are given a good bed of straw, and the draft of wind excluded, they will not pile up. I have tried most all kinds of shelter, from the sheds made of stock fodder and straw up to a good, warm house. If some of our farmers who have no shelter, especially some as good farmers as we have who rent farms and can't afford to build houses, they can afford to make shelter of straw and fodder that is going to waste. I want to say to my friends, you will find this one of the best investments you ever made on a rented farm.

But too much must not be expected of the shelter. A hog must be fed well to keep him comfortable in the best quarters. Neither should they be so full fed that they will not come to the feeding place promptly at feeding time.

Now, brother breeders, as to the house for farrowing, we have different kinds in the country. I have seen several kinds, all the way from the small, single house, from the one accomodating from fifteen to twenty sows. These latter I do not like. I think best not to have too many at one place. The single house is good. The worst feature is to get water and feed to them. I have one house with twelve and one with six farrowing pens. I prefer the house with six, as they are much easier to handle. As to the style, there are many. I have seen some with double pens, with halls between; the sows went out to feeding pens on north and south sides. This I do not like. When you open the doors on the north and south for the sows to be fed, you will be sure to have a draft through the house, either on or over the little pigs. Some days in February and March this would not do. I prefer the roof to slope to the north, three and one-half feet from floor on north and nine feet from floor on south, with feeding pen on south. This will give all the sun on a twelve foot floor. The breeding pens should not be less than 7 by 8 feet, with good tight floor as close to the ground as possible, and kept dry. Deliver me from a dirt floor. They are the warmest, and it is almost impossible to keep them from getting dusty and you all know what dust means with little pigs.

CHEAPEST HOG FOOD.

By A. Allen, Kidder, Mo.

Mr. President: The subject assigned me by our worthy Secretary is, "What is the Cheapest Hog Food." Now I am breeding and feeding hogs for the money there is in them, for the general market and the food that makes a pound of gain the cheapest I call the cheapest feed. Now, in this age, we all know that there is no single feed stuff that will make a pound of pork as cheaply as a combination of several different foods, and I will here say that corn and grass, clover preferred, with some oats and old process linseed oil meal; corn and clover for summer feeding and corn, oats and oil meal for winter feeding is the best and cheepest feed I know of, and if any one cannot make hog raising pay a good profit with plenty of these four feeds, we hope he will give us his experience with other feed stuffs. There is no feed that will take the place of corn as a part of the ration at any time of the year, nor anything that will so cheaply take its place as the greater part of the ration to finish it for market. Of course there are other feed stuffs that are of great value as pork producers, but as a general rule the four feeds I have mentioned will pro-

duce a pound of pork cheaper than any other combination that we know of, with this advantage in their favor, that we can generally raise an abundance of corn, oats and clover, and all we have to buy is the oil meal which is but a small proportion of the ration for one-half of the year.

HOW MANY ACRES FOR TEN SOWS AND PROGENY?

By J. E. Summers, Huntsville, Mo.

To determine indefinitely it would depend on number of pigs in litters. But supposing each sow to have 6 pigs, making, with the 10 sows, 70 head. We can now approximate the number of acres required for their support from time pigs are farrowed till ready for market, at about 10 months old. Before farrowing each sow should have a good, comfortable place for bed, and a lot of about one-eighth of an acre; here she should remain with her young till they are about three weeks old and strong enough to follow her about. Then she should be allowed the run of a good grass lot in the day time.

For early grazing a patch of rye of about five acres will be very good and will give the early pigs something green before pastures afford grass. From the rye patch they should go on to a good pasture of blue grass and clover, say of about 10 acres, making 15 acres of pasture. While this amount of pasture will support the sows and litters, I would much prefer to give them larger range, as the pigs would get more exercise and naturally build up better bone and constitution. Grass would be fresher and sweeter and droppings not so thickly scattered. Allowing that 15 acres is sufficient pasture, then we want about the same number of acres for corn, or for corn, small grain and roots, making a total of 30 acres, which will support the 10 sows and grow their 60 pigs from time they are farrowed till they are nice, well rounded, fat hogs, large enough to fill a barrel at 10 months old.

ADVANTAGES OF PUBLIC SALES.

By H. C. Sydnor, Corder, Mo.

Mr. President—The subject assigned me is one many of you are more competent to speak on than your humble servant; but if I can say anything that will interest you, I shall feel that some good has been accomplished. Anything I may say or suggest in this paper has been drawn from my own personal experience and observation. So if I depart from the strict text of my subject, I hope you will pardon me.

I entered into my first public sale with fear and trembling, principally on account of my very limited acquaintance with the breeders of the State; but having a very large local acquaintance and trade, I concluded to try one.

My thoughts were first directed to the public sale system from the fact, as the fall of the year came on and the demand for pigs became brisk, and people came (my friends and neighbors), some would spend a whole day before they bought. Though always glad to see and entertain them, it took up a great deal of time. Many would buy and leave them for a month before they came after them, and when other customers came to purchase pigs and saw those that were sold, they invariably wanted those very pigs; this always made it harder to make a sale. Then, again, some would be left over until spring, and they were always in the way during the breeding season, and generally went back some from fretting and not eating.

Another advantage, I thought, would be getting rid of them all at one time, and thereby lessen the chances from disease and sickness. Another reason was when selling privately the money came in small sums and apparently did not benefit. When selling at public sale it came all in a lump, and I could use it to a better advantage. Another advantage in the public sale is, if you sell off everything in the fall, there is nothing on hand to interfere with your sows during farrowing time next spring. Wishing to extend my trade and acquaintance without making expensive shows at the fairs and running the risk of cholera are some of the reasons that prompted me to try public sale and see how it would be with me. This was in 1891.

Prior to this time and since I have enjoyed a very large local trade, and without being egotistical, I believe as large as any breeder in the State. Previous to 1891 I had kept no record of the number sold or the price received, but generally sold all I raised at from $8 to $15 per head; since then a more complete record has been kept. My first sale consisted of 83 head, about 20 fall sows and the balance spring pigs; 80 head went to my old customers in my county and three head to breeders, the whole at an average of $14 per head. The price, though not large, the money all came at once, so I concluded to try another one.

My next sale consisted of 89 head; 85 head went to county men and four to breeders outside of the county. These were nearly all spring pigs. These sold at an average of $13 per head. The money came again all in a lump, and the farm was cleaned up of all surplus stock.

My next sale consisted of 70 head; 61 to county men and nine to breeders outside of the county, at an average of $13.50 per head. Money comes again in lump and farm cleaned up of all surplus hogs.

About this time or soon after, our late Secretary, A. J. Blake (who in my judgment did more towards the formation of this Association than any other man in Missouri), visited me and we talked over the public sale system and its advantages, and to his wisdom, advice and friendship I largely attribute the success of my fourth annual sale. This sale consisted of 83 head; 70 head going to county men at an average of $26 per head, and 13 head to breeders outside of the county at $31 per head. Following the advice of our late Secretary, I had advertised pretty well in our leading papers and the friends and acquaintances I had made at my former sales and at our first meeting at Moberly all contributed toward its success. Cholera destroyed about 100 for me last spring, so I made a small local sale, advertising with only a few handbills, at an average of $16 per head.

The advantages thus derived from the public sale system is given in my own experience as consisting of a more friendly relation among the breeders, gives us confidence in our ability to breed good hogs, and to free our farms of all surplus stock, thereby lessening the chances of cholera, and enabling us to carry our stock through the winter with less trouble and exposure. It serves to encourage and stimulate the new, as well as the old breeder, to fresh efforts to secure the best, and bring their herds up to the highest possible standard in the full confidence that they will be amply rewarded in the future. It serves to educate the masses to pay better prices and to take better care of their stock than they ever did before, and it gives the purchaser a chance to see a breeder's entire herd, thereby enabling him to make a better selection than if he purchased by order.

PUBLIC SALES OF PURE BRED HOGS.

By Col. Jas. W. Sparks, Marshall, Mo.

This subject is one of great importance, and covers the territory wherein a great deal might be said, yet I will touch it but lightly, and hope, after I am done, the breeders will join me in thinking and preparing for a better year in 1896 than has yet been in the business.

The selling of pure bred hogs at public auction has grown in favor so rapidly that today the breeder who expects to succeed must keep step with the procession, and as near the band wagon as possible.

One of the first steps to be taken is at breeding time, by using only those animals in the herd that are nearest to perfection. There is

not a breed of live-stock so strong today but what must have the best individuals constantly used on the herd to keep it up to the standard, as the work of live-stock improvement has been long enough and the path to success has been thorny enough and beset with disappointments enough at the best, when only those animals were used on the herd that ranked highest among the breed. So long as individual merit is kept in its proper place and not lost sight of, a breeder cannot be too careful of his pedigrees, but when a pig is purchased and used on the herd because of his breeding and not his merit, the breeder is on a dark road that is sure to lead to the ruin of a good herd. A breeder to be successful in the breeding and management of live-stock must have a love for the business to such an extent that he will in the first place make such selections as have been described, and never forget or neglect to properly care for them.

After you have selected your ideal breed and purchased the foundation stock, your career has just begun; whether or not you are successful in the undertaking depends largely upon how you manage the business. Opportunities to succeed come to all of us at one time or another, but we must be ready to take hold of them, for when once gone they are gone forever, and we cannot run the mill with the water that is past.

I have in my mind a breeder who at one time had success awaiting him at his first public sale, but for quantity, being in advance of quality, and the want of proper care and management, and lack of condition of his herd when the day of sale arrived, which was a disappointment to the breeders present, his sale was a failure, and his opportunities to success went with the disappointed breeders.

Another breeder writes me that he is thinking of holding a public sale, asks for a date, and any suggestions I may offer that would assist him in making his first public sale a success. I write him giving him date, and advise him to first prepare for his sale by culling and using the knife freely, and after he has done that, to prepare them properly for the sale ring, and after it has been well advertised, a successful sale generally follows. The result is, when his sale day arrives, I find him with 50 pigs selected from his herd of 75, all in proper condition, with the finish necessary in a successful sale, and after his sale is over we figure up the average, and find it has been the best in the State that year. See the difference between the two breeders; one is trying to "quantity" 100 head without ever culling or using the knife; the other is selling "quality" 50 head after culling and using the knife, and success follows.

I say cull closer. Away with the poor inferior pig. Already too many have been sold for the good of the breed. If we keep the public sale system what it is today we must use the knife more freely. It has been no common occurrence in my sales to see them going along well and good pigs selling high, until presently a pig that ought to have been made into sausage by the free use of the knife, makes his appearance in the sale ring, and produced a perceptible effect of $5 or $10 upon the price of three or four good pigs that follow him, the poor pig that ought not to have been sold at all, sets the price to a certain extent on those that come immediately after him. A breeder who is thinking of selling seventy-five or eighty pigs will find it often much better to cull twenty-five from them, and in some cases more, as the good ones that are left will bring more money than all, and the quality of the breeding stock will be much improved by it. The breeder, whether he sells at auction or not, should use the motto "Quality before quantity," yet I have made sales where the breeder seemed to have gotten it just the reverse, and the average made was very low; boars were offered that sold for less money than they would have brought for pork had they been trimmed young and had the same feed given them that was given the sale pigs. It was plain at many of the sales the past season that there were too many boars, yet when I would mention the fact to the breeder he would say, they will suit the farmers. Brother breeders and farmers attend these sales to get something better than they have at home, and are always ready to pay the price that quality brings. Are you selling quality in that number? A breeder's standing is lowered by neglect to cut out everything that is an inferior representation of his breed. The good name of many a noted breed has been tarnished by the selling of all the offspring for breeders. I say sort out closely, throw out the culls and let them go to the butcher.

After you have done this, arrange for a date with your auctioneer for your next sale early enough to give him ample time to work it up, as well as yourself, as he is often in a position to do you good from eight to twelve months in advance of your sale. Claim dates with the leading stock papers that you expect to advertise with, always being careful to claim and advertise with enough of them, so that the public may know what you are doing as well as yourself. Have stock in fix when sale day arrives, and over your home will grow these words in big golden letters: "Success comes in public sales to him who sells quality."

CAUSES OF RHEUMATISM AND WHAT I DO FOR IT.

By Ed. Dorsey, Perry, Ill.

In giving a definition of rheumatism we can do no better than to refer to "Robertson's Equine Practice," which says: "It is a febrile disturbance, most probably owing its origin to a morbid inbred or constitutional state of the system, often in conjunction with climatic influences, and characterized by the manifestation of much pain and a special tendency to the involvement of certain structures as the covering of muscles, tendons and joints, these local manifestations showing a disposition to shift their situations to other textures or organs of a similar nature but remote situation."

The causes may be spoken of under two groups, the indwelling or predisposing and the exciting or direct causes.

Under the indwelling or predisposing we may mention inbreeding or close breeding which weakens the constitution. It is also hereditary.

Under the head of exciting or direct causes we may mention exposure to cold and dampness, undue confinement, want of cleanliness, imperfect ventilation, sudden changes of temperature, especially when accompanied by excess of moisture in the atmosphere. Poor shelter will further insure an earlier and more confirmed form of the malady. It often follows other diseases, such as influenza, colds, quinzy, inflammation of the lungs, cholera, etc.

It is said by good authority that in rheumatism there is an accumulation of an unnatural acid in the blood, due to retention in the system of effete material, that should have been eliminated.

Symptoms.—One of the first symptoms is lameness, which developes suddenly. When the muscles are affected it may shift from one part to another, but in joints or the covering of ligaments it will likely remain until relieved. The hog is inclined to lie down most of the time, and when made to get up or move may squeal from the pain caused by exerting the affected parts. The absence of any external cause sufficient to account for the stiffness or lameness will lead us in such cases to suspect rheumatism. The suspicion, if correct, will be confirmed in a few days either by the sudden disappearance of the attack or by increase in the symptoms, or by its shifting to some other part. When the disease arises from exposure to cold or wet it generally affects the loins or shoulders, and is often called kidney worm if affected in the loin.

Treatment may be classed as curative or preventative. The curative treatment is a good, warm, dry house, good feed, such as bran mash, little oil meal mixed. Put in five drops of the tincture of bryonia, give in feed two or three times a day. As a preventative pay particular attention to the selecting of strong breeding animals; avoid breeding hogs that have been affected with the disease. It is not best to inbreed, nor close breed, as it is sometimes called. It weakens the constitution and renders the hog more liable to disease of any kind. Provide good shelter with plenty of room for proper exercise. Observe cleanliness, ventilation and location of sleeping quarters. Do not build houses in low, flat places; in fact, pay particular attention to their health. Preventative medicine consists of a good tonic given three or four times a week.

THE SWINE INDUSTRY OF MISSOURI.

By J. R. Rippey, Secretary Missouri State Board of Agriculture.

The Secretary of your Association ordered a paper on "The Swine Industry in Missouri," and his edict was law to the writer.

At the date of acceptance ample time was expected for the thorough consideration demanded by an industry of such immense value and importance to the farmers of the State. But other matters of vital importance demanded attention, resulting in a hastily-prepared paper on this subject.

In 1894 the last statistics reported to this office we shipped from the State two and a half million hogs. In addition to this we kept on the farms for the support of our rural population and interior cities probably one and a half million more, or a total hog production for the State in 1894 of four million head, worth thirty-two million dollars.

The breeding of swine is limited to no quarter of Missouri. The northwest with her immense cornfields, the northeast and central and Southwest with luxuriant pasturage and an abundance of grain, and the Ozarks with unlimited mast and fertile grain-producing valleys, each contributing to the grand total of our exports and receiving a part of the revenue derived from this industry.

Nor is any other industry more generally distributed among the farmers, nor any upon which a greater number of them depend for the income necessary to meet current expenses.

With the majority of our farmers the hog pays the grocer, the physician, the taxes, the interest, clothes the family, and practically supplies the table with meat.

He is a machine that, without cost to us, gathers up the waste that would otherwise be lost and converts it into hard dollars and transfers the products of our clover and cornfields into a satisfactory bank account.

In this State we grew, in 1895, 250,000,000 bushels of corn, and with almost unbounded supply of pasturage and all other conditions favorable, the industry is in its infancy and its possibilities are unlimited.

With this immense grain supply and the energy and industry of the people, Missouri could almost feed the world with pork and command the revenues of an empire. The hog receipts at Chicago for 1895 were approximately eight million head, against seven and a half million for 1894 and six million for 1893.

To supply a number equal to that sold in this immense market is not beyond the possibilities of Missouri at an early date, and with the yields of corn of 1895 continued, might be predicted with confidence.

While corn alone may not be the best hog feed and when fed in close pens may be conducive to disease and disorder, it is now and will probably remain a prominent factor in the production of pork in this State. If fed judiciously and on pastures with an abundance of clover, good water and suitable provisions for sheltering, you may expect a maximum profit from hog feeding and the minimum loss from disease.

Where clover grows so abundantly nothing is more profitable for the growing of hogs than a clover pasture. An early litter of pigs with a free run to clover may be marketed in the fall with the use of but little grain. As a matter of economy and as a sanitary condition it is probable that this way of growing and feeding hogs will not be improved upon in this State.

INBREEDING.

Can be done with profit only by the careful, prudent, close observer, who has thoroughly investigated the subject, knows what he is doing and where to stop. Individual animals that have had numerous infusions of fresh blood injected into the line from which they are descended will possibly admit of closer inbreeding than others, but there is a point at which the prudent breeder will desist, a danger line beyond which all is lost.

In a general way inbreeding promotes finish, uniformity and prepotency at the expense of weight, size of bone and constitutional vigor.

When used with great care it is a valuable aid in fixing a type, in developing a breed; but for the general grower and feeder of swine it is not likely to prove successful or profitable and is no doubt in many instances highly injurious.

There are neighborhoods whose farmers will tell you they never inbreed, yet it is possible that for years there has been no infusion of new blood into the hogs of that vicinity. It is true that the farmers may exchange male pigs, but they only get the blood that has been in the neighborhood for generations, probably wanting in vitality and predisposed to disease.

To the mating of such animals as these, add injudicious feeding, poisonous water, pens that have accumulated filth for years, sleeping quarters where, as Major Bell has well said: "The one side of the hog is frozen by wintry blasts and the other parched by heated manure," and you have conditions where disease and death revel in the midst of what is to them luxurious and possibly essential surroundings.

Males should be changed frequently and should carry new and vigorous blood. The price at which pure bred stock is now selling, the number and excellence of Missouri herds renders this change an item of small expense either for the purchase price or express charges. The profit of such an exchange would be not only in the way of increased vitality and vigor, but if you make good selections your herds will be continually improved in quality and finish.

If personal inspection of your purchase is inconvenient or expensive, you may very safely write any reputable breeder of the State, telling him what you want, and there is but little doubt but that his selection will be judicious and give satisfaction.

CHOLERA.

Estimates for this State for 1895 place the loss from cholera at 12 per cent of all the swine of the State, or approximately 480,000 hogs, worth four million dollars.

Some good thinkers are undecided as to whether this is a blessing or a calamity, holding that the decrease in meat products from the ravages of this disease may possibly advance the price to such an extent as to more than cover the loss.

The farmer who has lost all his hogs and his income from this source, with his unpaid annual bills staring him in the face, would with great difficulty be persuaded to take this view.

Nor can it be sustained with substantial reasons. It is certain that we can produce pork cheaper without the disease. A cheap product of the same quality finds an extended market, not only in foreign countries, but amongst a class of our own people, who, on limited earnings, cannot afford dear meat. Again, if the disease could be eradicated, and we could offer to the world a hog product that was

above suspicion, we would have made answer to one of the strongest arguments used in Europe against the use of our meat, that is that it is diseased and unfit for food.

But so far science has offered no remedy for this evil. Investigations have been continued through a long period of years, vast sums have been expended and volumes have been written, but no specific has been offered.

So-called cholera cures are without value except administered at an earlier stage of the disease than is now done, and many were designed only to gather from the unfortunate breeder his surplus dollars. It is possible that no remedy will ever be discovered for hog cholera, or swine plague, as we now know these diseases.

After the bacteria or germ is developed, and we are able to note its effects on the hog, when only a few hours, or days, at most, remain before death, is it possible that any remedy could be administered with success?

By injudicious feeding, breeding and want of care and sanitary regulations we develop a condition, we prepare a seed bed, we furnish royal quarters for disease and invite their occupation.

After we have made these provisions, have grown and multiplied the germ to a certain extent, the hog dies, the whole herd is affected with cholera, and we charge our misfortune to bacteria, about which we farmers know but little, forgetting, or not caring to remember, that we are solely responsible for the conditions that enabled this germ to exist and do his deadly work in our herd.

Might we not with profit look for the cause behind the period of germ life in connection with these plagues, and at this earlier date apply such remedies and adopt such sanitary measures as would remove the susceptibility to disease and enable the animal to resist its ravages?

It may be very seriously doubted if a hog in the pink of condition could be innoculated with hog cholera or swine plague with fatal effects.

With good sanitary regulations, pure water and a properly balanced food ration and vigorous animals, but little fear need be entertained from these destructive plagues.

Men have said that hogs die with cholera when kept under the most favorable circumstances.

But this may not be the case, and science may yet find conditions conducive to this deadly malady that had been overlooked in what appeared to be the best regulated pig pens.

BEST HOG.

That the best hog is the one that will produce the most pork at the least cost has been true in the past and he may be the most profitable now, but it is possible that in the near future quality of the meat may be considered to such an extent as to change this. Then we might properly say the best hog was the one that would convert a given amount of food into the most money.

In a country like ours, where the meat product is largely in excess of the demand for home consumption, the price is fixed by what we can get for the surplus.

When we enter the market of Europe we find the competition so keen and the prejudice against our meats so strong that every possible effort should be made to supply just what their market demands, and quality and manner of curing must not be neglected.

The Danish bacon is said to have the lead in the markets of England, and that its superiority is due solely to the manner of growing and feeding their hogs.

May we not be forced to produce meat equal in firmness and flavor and of such quality as to successfully compete with other producers or be driven from the markets where we now dispose of our surplus.

There may be a difference in the breed of hogs in relation to the quality of meat and the amount of money produced from a given amount of food, but it is certain that we are not agreed upon this question. However, we are all agreed that the slab-sided, gimlet-ended, tooth-pick snouted, razor back is no longer profitable or desirable, and that any of the improved breeds, where the individual is strong and vigorous, may be handled with better results and will produce a better quality of meat.

There is already a change in progress in relation to the quality of the meat. The large, coarse, 400-pound hog, seemingly prepared with special reference to the lard barrel, is no longer demanded. A finished hog, weighing from 200 to 250 pounds, will command the top of the market. This hog not only makes better meat, but can be placed on the market at a better profit, as it is unnecessary to winter him over, as was the case where great size and weight were required.

Again, if there was a breed of hogs, or some manner of feeding, that would produce a larger percentage of lean meat, it would no doubt soon become immensely popular and command an advanced price. To this date we have not produced hogs with a large percentage of juicy, lean meat in such quantities as to make a market. But there is a de-

mand for it from consumers, and if buyers knew where to make the inquiry, if such hogs were placed upon the market in sufficient numbers, an advanced price would soon be established for them. This question might receive the careful consideration of the advanced breeder, as, under existing conditions, the public is not compelled to buy all that we place upon the market, but we, in order to succeed, must supply their demands and cater to their tastes.

Our experimental stations and our progressive breeders should at an early date determine if any one breed possesses any advantage over the others in growing a large percentage of lean meat. No doubt but this quality may be improved in any of the breeds. Judicious selection and mating and proper feeding by breeders of sound judgment, and continued with that end in view, will accomplish the work.

Is there a breeder here today who will take the lead in improving the quality of meats that Missouri places upon the markets of the world? Or could not this State Association find profit in a united effort and determination to produce a bacon of superior quality, and that will successfully compete with any offered to consumers? May not Missouri lead in the laudable enterprise of furnishing the world a better meat, and such as would command the favor now accorded the Danish bacon?

It is true that the step from an ordinary article to one of superior merit, one that will stand the severe test of public criticism, is a long one, beset with thorns and bristling with obstacles.

It will demand the best thought, close observation and the most careful work. Experience teaches us, however, that the widest range for profitable investment, the open field for speculation, the richest rewards for enterprise are at the top, and on grounds not traversed by others.

Will Missouri lead in taking possession of these profitable fields, or will she follow others? Will she take an advanced position in this contest, or fix her camp in the rear?

If we are to move in the midst of progress, if we are to occupy high and advanced ground, then you men, the organized swine breeders of the State, must lead the way, mark out the road, and we farmers will follow.

IMPROVED BREEDS.

We are well supplied with foundation stock for this advanced movement. All over this State improved herds of the different breeds of hogs, that will compare favorably with any on the globe, are bred with success and profit. We can supply all the necessary foods and conditions, and no doubt should be entertained as to your judgment,

ability and energy in an enterprise like this. What you did at the World's Fair, in competition with the most progressive breeders of the world, not only surprised us, but attracted the attention of our sister States, and assures us that you can achieve success when you attempt it.

To return from that exhibition with 125 prizes, has given reputation to the swine breeders of Missouri, and should encourage renewed exertion to continue in the front ranks amongst the world's producers.

While there are many good breeders in Missouri, from whose reputation we would take nothing, we owe our exhibitors at the World's Fair a debt of gratitude which would certainly be a sufficient apology for naming them in connection with the improvement in the quality of Missouri swine.

To men like Gentry, Monsees & Wiley, Falk, Young, Brown & Luce, Scott & Risk and Gabbett, who had the courage to carry your banner where competition was keenest, where the contest was hottest, where the giants amongst swine breeders had assembled their produce, and carried with them such merit as enabled them to return that banner to you and to your State with victory and success inscribed upon its every fold, nothing is impossible in the way of swine improvement.

For improvement in Missouri swine, for advancement in this industry and the solution of problems connected with it, for an increase in its millions of revenue, and for honors to be won in competition with the future exhibits of the world, we depend upon you men, with assurance from the past that our confidence is not misplaced.

PROPER AGE FOR MATING AND BREEDING SWINE.

By. S. A. Chitwood, Rocheport, Mo.

Our worthy Secretary having notified me some time ago that I would be expected to prepare a paper on this subject, to be read at our meettng today, I have found it necessary to give it sôme thought and study.

Knowing that there are older and more experienced breeders present, I shall not attempt to dictate how mating and breeding should be done, but will simply give my experience on this subject, and I have given it no little attention in my own herd, for this, in my judgment, is the first and most important part of swine-raising.

I do not know how it is with others, but I find it no easy thing to breed and raise good pigs. It takes a good deal of care and labor, both mental and physical, to make anything like success.

No doubt you will think before I conclude that I have simply made an attempt to say something and have said but little. However, I hope I may be able to stumble onto some thoughts that will bring out something in the discussions to follow on this subject by older heads and breeders that may be of vast value and a great benefit to myself and perhaps others. Of course, it is not expected that what any one person could say upon this subject would be a law to go by, for there is no law to govern the breeders upon this subject, but what I say will only and simply be my opinion and others can and will express theirs as they see fit.

The proper age to mate and breed is something that is never thought of by a great many farmers, and they are that class of people who produce the hogs. A great many never know when their pigs mate or when to expect their pigs. They just simply let the pigs and shoats, as they call them, male and female, run together until they are about six months old, then they take the boys and dogs and run them all into the barnyard or some lot and knife all the young males except a choice looking fellow that they say they will let run for a boar, and often he is hardly fit for the feed lot, and in fact they had just as well have made a barrow of him, for the breeding has already been done. I know men who do not live more than five miles from this town that follow the above rule, and they raise a great many things they call hogs. Some of them count their acres by the thousands and own bank stocks and bonds, and you had just as well try to climb that wall without a ladder as to sell them a pig for ten dollars. You can't do it.

I think it is pretty well settled among all good breeders that breeding too early always stunts the growth and prevents the proper development of the frame.

Another fact too often overlooked is that of early breeding before the animal is well matured, is such a drain upon the system as to tend materially to lessen the vitality of the animal, so as to make them appear rough and sluggish, and they seldom, if ever, recover. I think generally a boar should be at least six months old, and eight is better, before permitting any service at all, and only then when proper pains and care have been taken to secure a steady and continued growth from birth.

An animal that has made a slow growth and development will make a much better breeding animal, if kept quiet and permitted no service until about eight or nine months old, than if used younger, and even then good care must be taken for at least three or four months not to per-

mit too often or too much service. I think the best plan is not to permit of but one service, always keeping the boar in a good roomy grass lot, at least during service or breeding season, turning the sows in with him and then separating as soon as the service is complete; never allowing more than three or four, at the most, per week. A boar may be used in this way after he is seven or eight months old without any material injury.

Now as to the sows; I think it almost an exceptional case when it will do to breed a young sow to farrow before she is 12 months, and only then when she is to farrow in the spring, say about May, after the grass is good. If she is to farrow in the fall of the year, I think she should be 15 months old at farrowing. If she has been fed so as to make a good, vigorous, thrifty growth, and is in good condition, she may be bred to farrow at 12 months old, if in the spring, about May, and do well.

It is too often the case that when pigs have been bought at long prices for breeding animals the purchaser is anxious to begin to get his money back as soon as possible by too early breeding. But at the same time it cannot be considered as a wise plan or a good idea, and not much economy to take the chances of ruining a fine individual or a good breeding animal, or even stunting the growth and development, simply to have the pigs come a month or two earlier.

Always feed so as to keep both sire and dam in good, thrifty, vigorous condition when they are to be bred, and after the service is completed take the sow away to a quiet secluded place where there is nothing to worry her. Always wait until both sire and dam are fairly well developed in every particular.

The proper plan is to breed for individual merit and not for large numbers. If we had 50 per cent less hogs on the market today and the quality 50 per cent better we would not have such a cry about low prices.

BREEDER'S PRIVATE HERD RECORD AND BEST METHOD OF MARKING LITTERS.

By F. M. Lail, Marshall, Mo.

Mr. President and Brother Breeders: "The Breeder's Private Herd Record and Best Method of Marking Litters," has been assigned me for discussion. While I may not be able to do the subject justice, I will endeavor to touch upon the points I think the most important.

At first thought we may feel that there is but little to be said on the subject, and nothing in it. But I know it is a matter of vital importance and worthy of our careful consideration.

It is possible that all breeders can so mark their herds, and then take their herd record and so describe every animal that any one with ordinary intelligence can visit his farm, take his record, go among his hogs and select by marks and description each and every animal. And if this description be attached to the animal's pedigree, the visitor may know, without other assistance, the whole herd and its breeding. But one may ask of what benefit is this to the breeder that knows all his breeding stock without any of this trouble?

I will answer: The breeder cannot always be at home, and the ordinary hired man often knows as little about the hogs, their names and their breeding, as the hogs know about Sunday, and all hog breeders are not blessed with boys upon whom they may rely for this work.

Visitors from a distance often come when the breeder is away from home, and cannot always wait until the breeder returns. Therefore, if marked and described as stated, what is there to hinder the visiting breeder from taking the record and going among the herd, and learning what he could learn in no other way in the absence of the owner.

Then again, suppose the owner of one of the largest and best herds in the country, with no one that knows the hogs but himself, and they are not marked or described, should from any cause be unable to go among his herd and point out his hogs of particular breeding, or, in the event of his death, leaving no marks or description by which his hogs could be identified, of what more value would these costly pedigreed hogs be to his estate than good grades.

Again, correct marking and describing begets confidence and confidence means a great deal when you are buying a pig. It means money in your pocket when you are selling a pig.

What breeder wants to buy a pig, let the pig be ever so good, if he has no confidence in its breeder?

I once described and priced a good pig to a breeder in Illinois, giving him the breeding of the pig. He answered, telling me he liked the description and price of the pig, but his grandsire was bred by a man in whom he could place no confidence, and he could not use the pig. The correct marking and correct describing helps wonderfully in making out correct pedigrees, and we all know that correct pedigrees save our recording secretaries a wonderful lot of unnecessary correspondence.

I suppose there is no one other subject that they have to deal with that causes so much unnecessary correspondence as incorrect pedigrees. I am proud to say that in the 15 years I have been sending in pedigrees for record, only two have ever been returned for correction, and only some trifling thing had been omitted in each of these.

But what is the best method of marking litters? There are many ways to mark litters, but I have found none better than the No. 5 spring harness punch, and I believe the illustration here attached to be so easily done and as near perfect as any system of marking I have ever seen.

Begin at the lower point of the left ear, make one notch, allowing the punch to be half full only, or half the punch in edge of ear. We call this No. 1, and after marking the whole litter exactly the same we make minute of it in our little book which we always carry, giving number of pigs in litter, number of boars and number of sows, and how marked. For No. 2 we make one notch in center of lower edge of ear, and mark all the litter and record as above. For No. 3 one notch near head, etc. Then we cross over to right ear; near head we make one notch for No. 4. For No. 5, one notch in middle of right ear; No. 6 in lower point. Then we start back on upper edge of right ear and make one notch at point for No. 7, and so on to beginning when we have 12 litters marked. If we have more litters we go around again, making two notches as above, and we have marked 24 litters.

TIME TO MARK.

Pigs should be marked before allowed to mix with other litters. I prefer not to mark before ten days or two weeks old, as the ear is very tender when quite young, and unless punch is very sharp we are liable to tear and disfigure the ear. The notch should not be made too deep as it never gets smaller. The best way I have found is to keep the litters entirely separate for two weeks, or longer if possible, and then mark just before allowing them to mix together. In this way we can avoid the arrogance of one litter robbing another. I don't think I have ever had a pig to rob another litter that had not been allowed to mix with others until two weeks old.

PROFITABLE AGE TO SELL A HOG AS PORKER OR BREEDER.

By Col. M. B. W. Harmon, Pickering.

Mr. President—I am unable to understand why I was designated to lead in a discussion of "The Proper Time to Sell a Hog," as it is the very thing I want to know myself. But if we can ascertain the

consensus of opinion of the Missouri Swine Breeders' Association, we will no doubt arrive at an approximately correct solution of this question which is more difficult than we at first glance are led to suppose—the market for the block varies so much. At one time the market requires heavy lard hogs, at another medium weights for breakfast bacon, and again light hogs for lighter meat.

Fortunately we have several standard breeds, viz.: Duroc Jerseys, Poland Chinas, Berkshires, Chester Whites and Victorias that can be made to fill all these conditions. Take an individual of either of these breeds with short necks, wide jowls, large heart girth, good bone and well haired—if fed on grass, with plenty of salt, ashes, cinders and charcoal or charred corn they can easily be made to weigh 100 pounds at three months, 200-pound breakfast bacon pigs at six months, 240-pound packing hogs at seven months and 400-pound lard hogs at one year old; so that the proper time to sell a fat hog is when you have a hog in the condition that the market requires.

The proper time to sell a breeding hog is more difficult to ascertain. I buy from three to five sows and from four to six boar pigs every year from respectable breeders, at from six to eight weeks old, quarantine them at least thirty days and then turn them in with standard pigs of same age for trial. By the time they are old enough to breed all physical defects will become apparent and one or more of the best can easily be selected and the others castrated or spayed and fed for lard hogs. To depend upon a single sire is fraught with too much danger to the coming pig crop. These pigs should be kept in the pink of condition and constantly growing, but never allowed to get fat. If by any accident or carelessness they ever should, then and right then is the time to sell them, not for breeders, but for lard hogs. The brood sows especially should never be allowed to get fat, as their vigor and vitality are impaired thereby. By buying pigs and raising my own breeders I can guard against a fat or other defective crop. A good brood sow carefully handled should be kept until six or seven years old and then fed for a lard hog. Such a sow can easily bring two litters a year of from six to twelve strong, vigorous pigs at a litter. At six weeks old the best of each litter should be selected for breeders and the culls castrated, kept by themselves and fed for the block. At ten weeks old the boar and sow pigs should be divided and each sex kept by itself. This, in my opinion, is the best time to sell for breeders, but I prefer to buy my new blood for breeders at from six to eight weeks old. They cost less, express bills are less, the dangers of shipping are less and they recuperate from the hardships of long confinement in crates quicker, and are more apt to make useful hogs.

WHAT I THINK OF THE SCORE CARD.

By Geo. P. Bellows, Maryville, Mo.

Little did I think when at the first meeting of this Association I defended the score card it would lead to my being called upon to publicly express my views in a paper on this question. Now, as then, I shall defend the good features of the card as I understand them, but I shall not be so rash as to claim perfection for it. I am not addressing a convention of men claiming to be expert judges, but rather an assemblage of breeders earnestly seeking reliable information that will help them to breed better and nearer perfect hogs.

I claim one of the essential requisites of a successful breeder is to know all the points and their relative value that combine to make a typical individual of the most perfect type of the breed. We know nothing we have not learned either through the costly but valuable school of experience or the study of what others have learned.

As an education, a sort of text-book, I know of nothing of greater value than the score card as an aid to the intelligent investigation and understanding of the value of the various points that unite to make a perfect hog. There are few branches of business requiring a higher degree of judgment for success than that of breeding improved stock. Nature has done more for some than for others in this respect; however, we should all cultivate and improve our judgment on all matters that either directly or indirectly affect our business. The farm hand, the clerk, the college professor and men in all other branches of business who have demonstrated that they sufficiently understand the questions entering into and affecting the results of their work to exercise more than ordinary good judgment, easily command a premium for their services. This does not come by accident, but is the result of cultivated judgment. As applied to swine breeding, we claim for the score card that its study and application cultivates and trains the student's judgment, enabling him to arrive at a conclusion, and furthermore, to be able to furnish a reason for the same. In evidence that this claim is well founded we will only need point to the fact that such agricultural colleges as our own great State and the no less progressive institution of the state of Wisconsin are using the card for the practical instruction of their students in teaching them the art of judging. Thus, they recognize to be a good judge of an animal depends on ability to place a proper and correct valuation on each point entering into its conformation. Following out this idea they under-

take to educate the student as to the relative value of each of the sections entering to the make-up of the animal. The instructions accompanying the score card describe a perfect condition of each point and also give a detailed description of the objectionable features.

This is to the beginner what the rule in arithmetic was to us in our boyhood days, explaining and assisting us in solving the problem. Few, if any, breeders buy their breeding hogs by the score card, but a knowledge of the practical application of the card will assist the breeder of limited experience in making his selections. Therefore, we think it a valuable aid or guide for the beginner.

Going deeper into this question we find that it was not until the score card was formulated that we had a model or ideal animal by which the living animal, the real product of the breeder's skill, might be compared in order to establish its claim to superior excellence. Before its adoption every judge of the product of our various breeds at our local and State fairs was at liberty to adopt his own standard. This would not have been so bad if the custom had ended with one judge and consequently one model, but when three judges with each a separate ideal composed, as was generally the case, the awarding committee, then the system became unbearable and their combined judgments a sublime farce.

From the start the strongest advocates of the card were found among the Poland China breeders, and probably its best results are to be seen in Poland China herds. That other breeds have been directly benefited by its adoption no one will be bold enough to deny. I must believe, as an educator, it is a step in the right direction. I do not think the system yet perfect or the model faultless. Perfection is never reached at a single step, no more than the summit of the mountain. Each step must be followed by another and still another in the same direction in order to reach or even approach the desired goal. The system of judging, guided by the score card, is founded both on good reason and sound philosophy. We are all so constituted, and our ideals of perfection so crude and limited, that to improve and elevate them is a difficult task, and comes only by slow degrees. Every improvement that comes to the product of our hands is first the result of a higher conception of our brains.

Probably the most plausible and serious objection that can be offered against the present card is that it uses the same model for both sexes. Another of the many objections offered to it is that the highest scoring pigs are frequently too small and compact to make good breeders. In my judgment the man that breeds the largest hog possible,

that will come nearest filling the requirements of the score card, will have the hog to fill the future demand for breeding stock.

In conclusion, it is not the experienced and practical judge that needs the card so much as the beginner who is laying the foundation for future success. Therefore, I think it has enough of virtue as an educator and guide to be worthy our future consideration.

HOG FEEDING—SUMMARY OF EXPERIMENTAL WORK.

Compiled by T. I. Mairs, member senior class in the College of Agriculture and Mechanic Arts, Columbia.

COMPARATIVE COST AT DIFFERENT STAGES OF GROWTH.

The Massachusetts State Experiment Station, Annual Report, 1889, in summing up the results of ten experiments in pig feeding suggests the follows:

"It is not good economy to raise pigs for the meat market to an exceptionally high weight. To go beyond 175 to 180 pounds is only advisable when exceptionally high market prices can be secured. The quality of the meat is also apt to be impaired by an increased deposition of fat."

The Vermont Station (Annual Report, 1890), gives the following results of the cost of growth at different stages:

	Average weight at end of period—pounds...	Average daily gain in live weight during the period—pounds..	Average cost of food consumed for each pound increase in live weight—cents.....
Period I.	51	1.20	2.47
Period II	103	1.28	3.70
Period III	160	1.40	4.89
Period IV	202	1.31	5.82

Thus it will be seen that it costs more than twice as much to produce a pound of gain on a 200-pound pig as on a 50-pound pig.

The Main Station (Annual Report, 1890) divides the time of feeding ten pigs of different breeds into three periods according to the weight, and gives the following results:

	Average weight at beginning of period—pounds	Average gain during period—pounds	Average amount of digestible material eaten per day during the period—pounds	Amount of digestible material consumed per pound gained during the period—pounds
Period I.—100 days	18 3	93 7	1.88	2.02
Period II.—35 days	112	58.4	3.73	2 44
Period III.—50 days	170.4	64	5	4.06

From the above table it will be clearly seen that the amount of food required to make a pound growth was greatly increased as the weight of the hogs increased. For example, in Period I about two pounds of digestible matter produced a pound of growth, while in Period III, four pounds, or double the amount will be required. In other words, the cost of gain was practically twice as great with 170 pound hogs as with hogs weighing 18 pounds.

FEEDING YOUNG PIGS.

The Wisconsin Station (Annual Report, 1890) gives the results of feeding six lots of pigs before and after weaning, in which it was found that the average cost of producing 100 pounds of gain before weaning was $2.87, including the feed for the mother, and after weaning, $2.75. From which they concluded that to obtain the best results the pigs should be crowded from the day they are born, feeding the dam heavily, for then the dam can be maintained and the pigs be made to gain 100 pounds at about the same cost as it would cost to produce 100 100 pounds gain in the pigs after weaning.

The Massachusetts Station (Annual Report, 1889) suggests that the food for young pigs during their earlier stages of growth should be somewhat bulky to promote the extension of their digestive organs and to make them thereafter good feeders.

DIFFERENT KINDS OF FOOD.

Corn has been and will continue to be the chief food for pigs in Missouri, and in giving the feeding values of different foods we shall endeavor, whenever possible, to compare them with corn. The ex-

perience of the farmer as well as the Experiment Station has shown that young and growing animals need a different ration from mature and fattening ones, because the growing animals must build up bone and muscle as well as fat.

Corn is deficient in those elements required for the production of bone and muscle, and hence is not suitable food for young and growing animals when fed alone. The Wisconsin Station (Annual Report, 1889) at the conclusion of a number of trials with several kinds of foods, summarizes the results as follows:

"If pork raising is to continue one of the leading industries, a large part of the product must continue to be the results of feeding corn. There is no doubt but what corn makes pork of fine quality and great firmness, if properly fed. Intelligently fed, corn is all right; only in its abuse is there any wrong. There need be no less corn fed but more protein food should be given in the shape of clover, blue grass, oats and other grains along with the corn.

DOES IT PAY TO GRIND CORN FOR HOGS?

This is a question that is continually confronting the farmer. The Maine Station (Annual Report, 1888) says: "The results of two years' experiments are certainly favorable to feeding whole corn, for it seems to produce as much gain, pound for pound, as meal, and the cost of the grinding is at least saved."

The Wisconsin Station (Annual Report, 1888) reports two experiments comparing the feeding value of whole corn with that of corn meal. Both lots were fed one pound of skim milk to each two pounds of corn or corn meal. It required 776 pounds of corn meal in addition to the skim milk fed to produce 200 pounds of pork, while of whole corn it required 840 pounds, a saving of about 10 per cent by grinding. With corn at 20 cents per bushel this would be a saving of two cents per bushel, scarcely enough to pay for the labor.

The Alabama Canebrake Station (Bulletin 8) reports an experiment in which pigs 9 months old, weighing about 80 pounds, at the beginning of the experiment gained faster on corn meal than on whole corn. The cost of 100 pounds gain on corn meal was $2.62, and on whole corn it was $3.92, a difference of 30 cents per 100 pounds gain in favor of corn meal.

The Kentucky Station (Bulletin 19) found as the result of two experiments that shelled corn produced fat more rapidly and at a cheaper rate than corn meal.

The evidence, then, from the experiment stations, indicates that it is doubtful whether it will pay to grind corn for pigs; for while in,

some cases the gain from corn meal was greater than from whole corn the difference was usually small and may have been due to a difference in the hogs used in the experiment.

COOKING AND STEAMING FOOD.

The Michigan Agricultural College (Bulletin 4) fed two lots of pigs on two parts of corn meal and one part of oats ground together, the feed for one lot being stirred up with boiling water, and for the other lot with cold water. The amount of food required to produce one pound of gain was 4.62 pounds of cooked and 4.7 pounds of uncooked, a difference altogether insufficient to pay for the cooking.

The Kansas Agricultural College (Annual Report, 1885–6) compared cooked with uncooked shelled corn. The amount required to produce a pound of gain was 7.5 pounds of cooked and 6.3 pounds of uncooked corn. The average gain per pig was 104 pounds for the lot fed cooked corn and 151 pounds for the lot fed raw corn.

The Wisconsin Experiment Station (Annual Report, 1886) reports 10 trials in which corn, corn meal and shorts, and barley meal were each fed raw and cooked. The following table gives the average amount of each feed required to produce 100 pounds of gain.

	Cooked—pounds.	Raw—pounds.
Barley meal	628	589
Corn meal	517	463
Corn meal and shorts, half and half	579	574
Whole corn and shorts	564	484

Thus it will be seen that the value of every one of these foods was apparently diminished by cooking.

The Wisconsin Station (Annual Report, 1894) gives the following summary of the results of 36 trials with cooked and uncooked food:

WHOLE CORN.

One trial at Kansas College (Report Prof. Agri. '85).

Two trials at Iowa Agricultural College (Coburn's Swine Husbandry). Loss by cooking, 17 per cent.

CORN MEAL.

Nine trials at Maine College (Annual Report Trustees, 1878).

Two trials at Iowa (Coburn's Swine Husbandry).

Two in Wisconsin. Loss by cooking, 17 per cent.

WHOLE CORN AND SHORTS.

Two trials at Wisconsin Station (Fourth Report). Loss by cooking, 1 per cent.

CORN AND OAT MEAL.

One trial at Michigan College (Bulletin 4). Gain by cooking, 2 per cent.

BARLEY MEAL.

Four trials at Wisconsin Station (Fourth Annual Report). Loss by cooking, 5 per cent.

BARLEY, RYE AND PEA MEAL.

Two trials at the Ottawa, Canada, Station (Bulletin 15). Gain by cooking, 1 per cent.

PEAS.

Five trials at Ottawa, Canada, College (Report 1876). Loss by cooking, 4 per cent.

POTATOES.

One trial at Maine Station (Report 1886–87). Gain by cooking, 12 per cent.

After giving the above summary the Station reports five trials in feeding cooked and raw corn meal, in which the "greatest care and attention were given to making a pudding just as palatable as possible for the hogs."

"As a result of these trials we may say that under the most favorable conditions we have been able to secure, and with the greatest care in the preparation of the cooked food, we were enabled to make a saving of 3.4 pounds of meal for each 100 pounds when feeding cooked meal to swine" in comparison with the uncooked meal.

This saving is entirely too small to justify the average farmer going to the expense of fitting up apparatus for cooking his pig feed even disregarding the extra labor required in cooking and feeding the cooked feed. Suppose his outfit is to cost him $25 and corn to be worth 30 cents per bushel, he would have to cook 2500 bushels at the rate of gain shown by these trials to pay for the outfit alone.

MOISTENING AND SOAKING FOOD.

The Wisconsin Station (Annual Report, 1888) reports two trials of feeding a mixture of corn meal and shorts dry and moistened with water. In one trial equal parts of corn meal and shorts were used, and in the other, two parts corn meal to one part shorts were fed. The first trial required 482 pounds of dry food or 401 pounds of wet food to produce 100 pounds of grain, the second trial required 610 pounds of dry food or 473 pounds of wet food to produce 100 pounds of gain.

In two trials at the Illinois Station (Bulletin 16) whole corn was fed alone either dry or soaked. In both of these trials, the pigs fed on soaked corn ate more and gained more than those on dry corn. In one trial they gained more and in the other less in proportion to the amount of food eaten than those on dry corn, but the difference was not large in either case.

At the New York State Station (Annual Report, 1893) two trials were made with pigs on wet and dry food. In the first trial the two lots were fed each the same amount of food. The trial extended from June 8 to September 14, and the total gain of the 7 pigs on wet food (soaked 24 hours) was 449 pounds, and of the 7 on dry food 448 pounds.

In the second trial the pigs in each lot were allowed to have all they would eat. Each lot contained eight pigs averaging 133 pounds when the trial began. The trial extended from Februry 9 to April 13. The pigs having the wet food (soaked 24 hours) ate a little more than those having dry food and made a slightly more economical gain, requiring 338 pounds of dry matter to produce 100 pounds of gain, while those fed on dry food required 351 pounds. The pigs fed on dry food made more regular gains and had better health in each trial than those fed on wet food. The average losses in dressing five pigs fed on wet food was 24.2 per cent and in dressing the eight on dry food was 22.9 per per cent.

CORN MEAL VS. SHORTS, BRAN AND MIDDLINGS.

Corn meal, shorts and a mixture of equal parts, by weight, of the two were compared at the Wisconsin Station (Annual Report, 1885),

feeding as much of each ration as was eaten clean. The following table shows the relative values of the three rations :

	Average gain from July 20 to August 31—pounds	Food eaten during period—pounds	Food eaten to produce 1 pound gain—pounds	Cost of food eaten to produce one pound gain—cents
Corn meal	104	558½	5.3	4.3
Shorts	95½	501½	5.3	3.7
Mixture	107	469½	3.3	3.3

These figures are for corn and meal at 80 cents per 100 pounds (40 cents per bushel) and shorts at 70 cents per 100 pounds, or $14 per ton.

In a later trial at the same Station (Annual Report, 1890) shorts, bran and corn meal were compared with corn meal alone. The lot fed shorts, bran and corn meal made a far more rapid and economical gain, had stronger bones and a greater portion of lean meat. The first lot was fed 13 weeks on a mixture of two parts shorts and one part bran, by weight, and the following six weeks on corn alone. The second lot was fed on corn alone during the entire 19 weeks. The first lot required 524 pounds of the shorts, bran mixture to produce 100 pounds of gain, and after the change 448 pounds of corn. The second lot required for the whole period 726 pounds of corn to produce 100 pounds of gain.

The Vermont Station (Annual Report, 1890) reports a trial comparing shorts with corn meal. The pigs, at the beginning of the experiment, averaged about 20 pounds. In this trial corn meal proved to be worth about 11 per cent more than wheat middlings or shorts.

At the Missouri Station (Farm Bulletin 10) for a continuous period of six years 94 pounds of ship-stuff gave the same gain as 100 pounds of corn meal.

CORN VS. WHEAT.

The Ohio State University, Department of Agriculture (Agricultural Student, Vol. I, No. 1), made comparative test of wheat and corn; the grain was fed whole and dry. A bushel of wheat made 13.7 pounds of gain, and a bushel of corn made 12.3 pounds. With wheat at 55 cents per bushel the cost of feed for 100 pounds gain was $4.01, while

with corn at 35 cents the cost was only $2.85, leaving a difference of $1.16 on each 100 pounds of gain produced in favor of corn.

At the Missouri Station (Bulletin 29) comparison of corn and wheat in different forms and in varying proportions was made.

	Per cent increase on original weight.	Pounds food eaten to produce one pound of gain.
Corn chop 4 parts, bran 1 part	89.4	5 13
Corn chop 2 parts, wheat chop 2 parts, bran 1 part	90.2	5.40
Wheat chop 4 parts, bran 1 part	93.5	4.90
Wheat chop	126.9	4.35
Wheat chop (soaked 36 hours)	134.7	4.13
Whole wheat 4 parts, bran 1 part (dry)	89.1	5.13
Whole wheat 4 parts, bran 1 part (soaked 36 hours)	84.1	5.93

The following statements are found in the summary of the bulletins:

"Wheat as a food for growing pigs is superior to corn, weight for weight. Neither wheat nor corn gave the best results when fed alone. Both should be mixed with a food rich in nitrogen, such as peas. Very young pigs cannot be reared at all on a clear wheat diet."

CORN VS. COTTON-SEED MEAL.

The Texas Station (Bulletin 21) compared cotton seed in various forms with corn meal. The lot receiving corn alone made the largest and cheapest gain. In the first trial 10 out of 20 and in the second trial 7 out of 15 pigs died within 10 weeks after beginning to feed the cotton-seed.

The Kentucky Station (Bulletin 19) could not feed cotton-seed meal profitably to pigs along with corn.

CORN VS. POTATOES.

The Wisconsin Station (Annual Report, 1890) reports a trial in which potatoes were fed alone and with corn meal and shorts. It required nearly 4½ pounds of potatoes to take the place of one pound of corn meal. Shorts did not give quite as good results with potatoes as did corn meal.

The Kansas Station (Bulletin 9) compared a mixture of equal parts of shorts and bran with a mixture of equal parts of corn and

potatoes. 4.79 pounds of bran and shorts and 6 pounds of corn and potatoes produced a pound of gain. In comment they say: "The potatoes were of undoubted value, considered either as an appetizer or a true food. The potatoes and corn seemed to be better relished when cooked together than when raw."

At the Missouri Station (Bulletin 29) it required about 8.2 pounds of potatoes to be worth one pound of wheat chop, and wheat chop was slightly more valuable than corn.

CORN VS. SKIM MILK.

Skim milk, while it is limited in supply on most general farms, yet has been shown by the experiment stations to form one of the best and most economical bases for a ration for growing pigs. The dairymen have in general discovered the feeding value of skim milk.

The Massachusetts State Station (Annual Report, 1890) recommends mixing corn meal with skim milk in the following proportions:

Live weight of animals—pounds.	Corn meal per quart of milk—ounces.
20 to 70	2
70 to 130	4
130 to 200	6

The Wisconsin Station (Annual Report, 1883) found that skim milk and corn meal produced the same gain when the pigs were given all they would eat. It required four pounds of corn meal or 19 pounds of skim milk to produce a pound of gain. When the two were mixed the greatest gains were produced when two pounds of corn meal were fed to three and one-third pounds of skim milk.

At the Maine Station (Annual Report, 1889) corn meal was found to be worth eight times as much as skim milk, weight for weight. "When skimmed milk is substituted for a part of the ration of corn meal without changing the amount of digestible dry matter fed, the efficacy of the ration was greatly increased. A still further substitution of milk for meal appeared not to materially increase the rate of growth. For instance, a ration one-third the nutrients of which were furnished by skimmed milk in a single trial proved to be worth practically as much as a ration two-thirds of the nutrients of which came from skimmed milk."

The Vermont Station (Bulletin 18) found that the feeding value of skim milk for pigs decreased as the pigs increased in weight. Deducting the cost of corn meal at $18 per ton and bran at $16 per ton

from the amount received for the pigs, the following is the price realized for skim milk:

Weight of pigs at beginning of period—pounds.	Amount realized for skim milk per 100 pounds—cents.
15 to 27	32
50 to 80	25
80 to 120	23
100 to 175	14
Average	24

The experiment began May 14, when the pigs were within two days of five weeks old, and continued until November 11.

At the New Hampshire Station (Bulletin 11) a mixture of two parts by weight of skim milk and one part of corn meal was compared with a mixture of equal parts of wheat, middlings and corn meal. "The rate of grain was unmistakably greater on the skim milk and corn-meal than on the grain alone, while the cost of growth (with skim milk at 25 cents per 100 pounds and corn meal at $20, and middlings at $26 per ton) was from 1.2 to 1.19 cents greater per pound when the food was mixed grain. With thrifty pigs, 20 to 30 cents per hundred can be realized for skim milk when live hogs sell at 4 cents per pound. It must be kept constantly in mind, however, that they must be sold by the time they reach 200 to 230 pounds live weight." The average cost of food per pound of grain, at the above prices, was 3.6 cents on skim milk and corn meal, and 5.2 cents on the mixed grain ration.

SKIM MILK VS. BUTTERMILK.

Two trials were made at the Massachusetts State Station (Annual Reports, 1884 and 1885) to determine the relative value of skim milk and buttermilk. In the first test they were fed in equal quantities with equal quantities of corn meal, and although the skim milk contained a fifth more solids than the buttermilk, the gains were about the same. The solids in the buttermilk ration proved more effective, for in it 2.4 pounds of solids produced a pound of gain, while in the skim milk ration 2.9 pounds of solids were required.

In the second trial equal amounts of dry matter were fed instead of equal quantities of milk and corn meal. In this case skim milk proved to be better, gallon for gallon. Buttermilk at 1.37 cents per gallon was somewhat cheaper than skim milk at 1.8 cents.

At the Wisconsin Station (Annual Report, 1886) two lots of pigs were fed 96 days on a ration composed of 2½ pounds of corn meal and 2½ pounds of shorts mixed with 10 pounds of sweet skim milk or buttermilk, as the case might be. The pigs were 114 days old at the beginning of the trial. The lot fed on the skim milk ration gained 420½ pounds, and the lot fed on the buttermilk ration gained 382 pounds. "Valuing the shorts and corn meal at $15 per ton, and hogs at $4 per 100, live weight, we find that the sweet skim milk was worth 20.6 cents per 100 pounds and the buttermilk at 14.7 cents per 100 pounds in these trials."

The Vermont Station (Annual Report, 1892) found no difference in value between sweet skim milk and sour skim milk, but the pigs fed on sweet milk shrank slightly more in dressing than those fed on sour milk. This, however, may have been due to other causes than the food.

ADDING BONE MEAL, ASHES, ETC., TO CORN.

Corn being deficient in bone-making constituents, the Wisconsin Station (Bulletin 25) tried the effect of feeding bone meal and hard wood ashes along with corn. "The effect of the bone meal and ashes was to save about 130 pounds of corn, or 28 per cent of the total amount fed in producing 100 pounds of gain live weight. By feeding bone-meal the strength of the thigh bones was doubled; ashes nearly doubled the strength of the bones."

"The ashes and bone meal seem limited to building up the bones and aiding digestion, but this is enough to give them a high value with any farmer who feeds much corn. Hard wood ashes seem to do the work about as well as ground bone, so that most farmers have the desired material at hand for the mere saving. Farmers whose hogs become too fine in bone have in hard wood ashes a substance which will help prevent that trouble."

SILAGE AND GREEN FODDER.

The Wisconsin Station (Annual Report, 1888) tried feeding corn silage to pigs, but found that "they would eat it only when it contained a large amount of ears, which they would search out and leave the other portions unconsumed."

At the New York State Station (Annual Report, 1890) "it was found that the pigs would not eat enough from the ensilage alone to make any gain unless fed such a very large amount that it was simply rooted over for the pieces of corn on the cob, which were at all times first eaten. Where simply maintenance of mature animals was desired the ensilage served very well."

The Ontario Station (Bulletin 54) found "that when store pigs (stockers) are fed in winter on corn ensilage and a meal ration, which is but a small percentage of the whole ration, they are fed at a loss."

In two trials at the New York Station (Bulletin 28, New Series), in which green clover formed the principal part of the diet, the gain made was very small. Oat and pea forage gave better results, but was worth only about $2 per ton; with hogs at 4 cents sorghum was eaten moderately well, but prickly comfrey was not eaten in quantities sufficient to maintain the weight of the pigs.

At the Utah Station (Annual Report, 1891) 10 pounds of lucern (alfalfa) produced a pound of gain when fed with wheat.

PASTURE AND EXERCISE.

The Utah Station (Bulletin 28) gives the following summary of the results obtained at that station:

I—Pigs allowed to roam at will over 18 acres of good pasture and fed all the grain they would eat made the most rapid growth, and apparently made the best use of food.

II—Pigs fed grass and grain in a small yard made a more rapid growth than those fed grain alone, and apparently made a slightly better use of the food eaten.

III—In cases I and II there was an increase in food consumed, apparently sufficient to account for the more rapid growth and more economical use of food.

IV—Green grass appears to be of greater value as an appetizer.

V—Pigs kept on grass alone made a slow growth—so slow that it would require two seasons for maturity—making the profits exceedingly doubtful.

VI—Pigs kept in a movable pen on pasture ate within seven pounds as much grain as did those in a yard without grass, but did not make as good use of it.

VII—Exercise seems to be necessary to increase consumption and probably digestion, that growth may be rapid and economical.

The experiment extended from June 5 to October 6, and the pigs averaged about 60 pounds each at the beginning.

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